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UNITED STATES DEPARTMENT OF THE INTERIOR

ENVIRONMENTAL IMPACT STATEMENT

PREPARED BY

THE BUREAU OF LAND MANAGEMENT

PROPOSED 1980 OUTER CONTINENTAL SHELF
OIL AND GAS LEASE SALES A62 AND 62

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DEPARTMENT OF THE INTERIOR

DRAFT

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BUREAU OF LAND MANAGEMENT

DEPARTMENT OF THE INTERIOR

Frank Gregg

DIRECTOR

BUREAU OF LAND MANAGEMENT

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SUMMARY

1. Preliminary Information

Proposed OCS Oil and Gas Lease Sales A62 and 62

Draft (X) Final ( ) Environmental Impact Statement

Comments due by:

November 19, 1979

Type of Action:

Administrative (X) Legislative ( )

Lead Agency:

United States Department of the Interior
Bureau of Land Management
Outer Continental Shelf Office
New Orleans (Orleans Parish), LA 70130

Contacts:

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Area of Project Impact:

Coastal Counties/Parishes of Texas, Louisiana, Mississippi, Alabama and Florida

2. Description of Area and Proposed Action

At the outset of this environmental impact statement, it should be noted that it is the first to be prepared by this office implementing the Council on Environmental Quality's new regulations. These regulations require a number of innovations which were designed to make environmental impact statements more useful to decisionmakers and the public.

It should also be noted that this environmental impact statement covers two (2) sales, and that the term "Sale 62" will refer to both Sale A62 and Sale 62 unless indicated otherwise or a different meaning is obvious. Due to the geographic and chronological proximity of the sales to each other, it was decided that a single statement would suffice and avoid needless duplication. The Table of Contents will serve as an index to the reader and list information relative to sale specific data and impacts.

These proposed sales of oil and gas leases for the Gulf of Mexico include 296 tracts located on the Federal Outer Continental Shelf and total 1,517,787.37 acres. Tracts selected for Sale A62 total 222 offshore in the Central and Eastern Gulf. These comprise 1,099,057.37 acres and range from 3 to 104 nautical miles from shore in water from 12 to 2,179 feet (4 to 700 meters) deep. Tracts selected for Sale 62

total 74 offshore the Western Gulf of Mexico. These comprise approximately 418,730.00 acres and range from 11 to 99 nautical miles offshore in waters from 30 to 1,460 feet (10 to 470 meters) deep (see figure 1). Of Sale A62 tracts 57.2 percent are gas prone, 19.4 percent oil prone and 23.4 percent both oil and gas prone. All Sale 62 tracts are gas prone. Pending final decision by the Secretary of the Interior, these proposed lease sales are tentatively scheduled for September 1980 (Sale A62) and November 1980 (Sale 62).

3. Issues and Areas of Concern

Coordination with Legal Agencies

As authorized by the OCS Lands Act, as amended, Bureau of Land Managemen (BLM) and U.S. Geological Survey (GS) serve as the primary Federal agencies administering these sales. They are in constant coordination with each other throughout the presale processes and the production phases, as well as coordinating as appropriate with other Federal, state and non-governmental agencies and organizations.

Determination of Public Issues and Areas of Concern

New regulations establishing uniform procedures for implementing the National Environmental Policy Act were issued by the Council on Environmental Quality (CEQ), November 29, 1978. As summarized in the *Federal Register*, the principal aims of the regulations are to reduce paperwork in the preparation of environmental impact statements, reduce delays and produce better information for decisionmakers.

One very important aspect of the new regulations is the requirement for "an early and open process for determining the scope of issues to be addressed and for identifying the significant issues related to a proposed action." They specify that "this process shall be termed scoping." The name of the process reflects the intent that it should "determine the scope and the significant issues to be analyzed in depth in the environmental impact statement."

With regard to Proposed Sales A62 and 62, the New Orleans OCS Office started the scoping process in January 1979 after coordinating with the Governor's OCS coordinator in each state adjoining the sale area, in order to utilize state suggestions and to maximize public participation. Accordingly, scoping meetings were planned, publicized and held in Brownsville and Galveston, Texas; Morgan City and New Orleans, Louisiana; Gulfport, Mississippi; Mobile, Alabama; and Pensacola and Panama City, Florida. Despite considerable effort made to publicize the meetings, overall attendance was disappointingly small. The effects of the proposed sales on fishing, employment and military activities in a multiple use area were the chief concerns voiced by attendees. Reports of these meetings are on file in the BLM New Orleans OCS Office.

Major Environmental Issues and Areas of Concern

The scoping process and coordination with other Federal agencies identified the following eight environmental issues and areas as meriting special attention and emphasis in the environmental assessment process:

(1) Destin Dome Multiple Use Area
(2) Employment
(3) Shoreline Recreational Resources
(4) Recreational Fishing
(5) Endangered Species
(6) Fisheries Resources
(7) Air Quality
(8) Water Quality

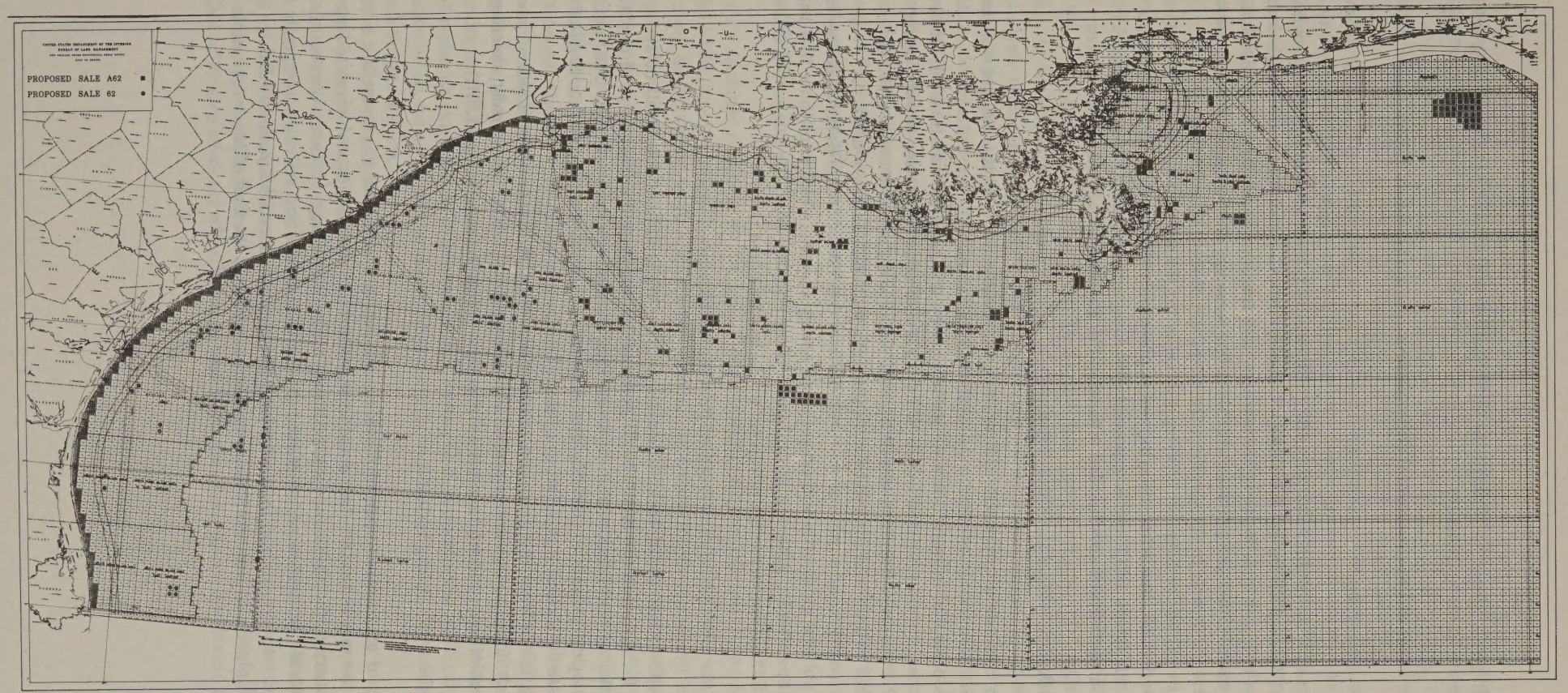

FIGURE 1. PROPOSED TRACTS

These impacts, identified through the coordination and scoping process, are addressed in this statement as they relate to each alternative.

4. Major Alternatives and Environmental Consequences

a. Summary of Alternatives

In comparing the alternatives to holding this sale see table 2 in section II.E. It should be noted that Alternative A (Holding the Sale), Alternative C (Delay the Sale) and Alternative D (Cancel the Sale) are regional actions and each include the entire sale area (296 tracts). Alternative B (Modification) is comprised of six discrete areas within the sale area which, for one reason or another, are subject to possible deletions. The table represents impacts to the specific alternatives and discrete areas addressed.

The basic difference between delaying and canceling the sale is that tracts are held in abeyance for an extended period of time when delaying (as opposed to withdrawal) and can have short-term effects (depending on the length of delay) as opposed to the long-term effects of a cancellation. All of the alternatives will have impacts which are discussed in Section IV, Environmental Consequences.

Alternative "A" - Hold the Sale as Proposed

Holding this sale as proposed will result in the continuation of the ongoing oil/gas exploration, development and production activities in the Gulf of Mexico.

This proposal will increase domestic production by 27.1 million barrels of oil. At current U.S. oil consumption rates, the oil produced would be equivalent to about a one-day supply, or about 3.3 days of imported oil at a rate of 7.9 million barrels of oil per day. Likewise, an estimated 735 billion cubic feet of natural gas would be produced and represents a substantial amount of production.

This is judged to be a gain for the United States from both a standpoint of energy needs and the economic and political goals of independence from energy imports which contribute to a balance of payments deficit. Specifically, assuming the oil production resulting from the sale would be substituted for imported oil, $542 million in foreign payments would be eliminated.

Alternative "B" - Modify the Proposal Via Tract Deletions

The proposed sale could be modified by deleting tracts in any one or all of six discrete groups located within the proposed sale area. The purpose for deleting these discrete groups of tracts is to avoid or mitigate potential adverse impacts from legal disputes, multiple use conflicts (i.e., DOD areas), biological protection, geological hazards, engineering concerns and coordination zone conflicts. Each of these modifications is discussed in section II.B.1. through B.6.

Deleting tracts from this proposed sale would tend to reduce the overall risk of possible impacts that could occur if the tracts were developed (refer to section IV.B.1.). Conversely, deleting tracts could reduce the overall oil/gas production resulting from these tracts (refer to section I.E.1.).

Alternative "C" - Delay the Sale

A delay of an indefinite period (between 1-2 years) would hold up production activities for the length of time the sale is delayed. This could have adverse economic impacts which would especially affect the smaller industry-related businesses and probably necessitate foreign imports to replace the lost production. (For a detailed discussion of the relationship of OCS production activities to onshore facilities and support services, employment and induced consequences, see sections IV.A.3. and IV.B.1.b.) Conversely, it could allow completion of some current environmental studies in the Gulf of Mexico, possible introduction

of technological improvements in OCS operations to increase resource recovery, and an extension of lead time for local governmental bodies to plan for onshore impacts.

Alternative "D" - Cancel the Sale

Not holding the sale would have both advantages and disadvantages. The advantages are that certain environmental losses which might result from holding the sale would not occur. The disadvantages consist of foregoing the gains which are expected to result from the sale, especially in terms of oil and gas, and also in terms of employment and income which, as indicated in Delay the Sale, affects industry-related businesses, particularly the smaller business concerns who are dependent on OCS development. This non-production would not be in accordance with national policy to become independent of foreign import of oil.

b. Summary of Environmental Consequences

To evaluate and compare the possible environmental consequences of this proposed sale, four alternative scenarios were considered: Alternative "A" - Hold the Sale as Proposed, Alternative "B" - Modify the Proposal Via Tract Deletions, Alternative "C" - Delay the Sale and Alternative "D" - Cancel the Sale.

In evaluating the environental consequences of Alternative "A" the basic development assumptions in section I.E.2. were used. Also considered were the following three assumptions: (1) no additional construction of onshore refineries or support facilities would be necessary; (2) three oil/gas pipelines with associated onshore terminal/storage facilities may be constructed, one in the vicinity of each of these locations: Corpus Christi, Texas; Caillou, Louisiana; and Navarre, Florida; and, (3) there would be at least one oil spill greater than 1,000 bbls during the production life of these tracts.

As part of the overall scoping and evaluation process, a Summary Impact Assessment of all potential impacts (Appendix B) was prepared in order to determine which environmental consequences were relative to the proposed action. Eight sale-specific issues were identified as follows:

Alternative "A"

Impact on Multiple Use Area — An agreement between DOD and DOI pertaining to the multiple use of tracts A62-185 through A62-221 in the Destin Dome Area has not been finalized.

Impact on Employment — A considerable amount of employment (job opportunities) will be generated, which could have a beneficial impact, particularly at the local level, by reducing the potential level of unemployment. New resident population induced by this employment will result in small increases in the demand for housing, education and other public services. It is expected these increased demands can be met without significantly lowering existing service levels or standards.

Impact on Air Quality — The Secretary of the Interior is legally bound to control air pollution from OCS oil/gas activities which may significantly affect the ambient air quality of coastal states. Furthermore, all onshore operations which result from this proposal would be required to meet all Federal, state and local air quality standards. These legal requirements, coupled with the fact that the proposed sale would continue the pattern of replacing existing production rather than adding to it, support a conclusion that there would be no cumulative effect on air quality and only slight, if any, localized air quality degradation in the vicinity of terminal/storage facilities.

Impact on Water Quality — There could be some localized short-term effects from oil spills and blowouts, as well as from normal activities, related to the proposed sale. These effects would include turbidity and the introduction of other pollutants, which are difficult to quantify partly because no significant water quality degradation resulting from OCS oil and gas operations in the Gulf of Mexico has been observed. In any event, Federal regulations should mitigate any impacts.

Impacts on Fisheries Resources — There is no evidence available to indicate that OCS oil/gas operations in the Gulf of Mexico adversely affect fisheries resources. Area fisheries are dominated by species asso-

ciated with estuaries, which are more sensitive to oil spills than the open ocean, and any major adverse impacts over the years would almost certainly have affected these fisheries. Platforms and pipelines apparently have had a favorable effect on snapper-grouper fishing because they are artificial reefs.

Impact on Endangered Species — Formal consultations with the Fish and Wildlife Service and the National Marine Fisheries Service regarding Gulf of Mexico OCS oil/gas activities have generated opinions that the proposed sale would not jeopardize the continued existence of the endangered or threatened species considered in the consultations. And, while there is no historical evidence of a measurable impact to these species, there is a possibility of a moderate localized impact to certain discrete populations of brown pelicans and marine turtles from oil spills and onshore construction activities.

Impact on Shoreline Recreational Resources — The proposed sale would probably cause minor, intermittent physical and visual pollution, which would most likely affect beachfront recreationists and contribute to maintenance problems of shorefront beach and park administrators. This impact would be a nuisance to some beach users, but is unlikely to affect the level of use.

Impact of Recreational Fishing — Offshore recreational fishing would be enhanced by this proposal. This conclusion is based on the impacts already demonstrated at approximately 2,500 existing structures situated offshore.

Alternative "B" — Alternative B involves reducing the scope of Alternative A (Hold the Sale as Proposed) by one or any combination of 6 proposed deletion modifications. The least reduction in scope (5 tracts) would result from modification B-1, while the maximum reduction in scope (120 tracts) would be attained by all 6 modifications. Overall, the deletion of tracts would tend to reduce the risk of possible impacts but at the same time it would reduce the possible oil/gas production as a result of this proposed sale. Specifically, all six of the tract deletion options, B-1 through B-6, would reduce the overall risk of an oil spill as an impact producing factor. Also, deletion of these tracts would have a negative impact on socio-economic parameters, and a loss of possible bonus, royalty and investment monies if the tracts were not leased.

Alternative "C" — By delaying this proposed sale for an indefinite period of time (1-2 years), positive and negative effects would occur. On the positive side, time gained is the essential factor. This would allow additional time for environmental studies, possible resolution of inter/intra Federal and State concerns, and potential development of improved recovery techniques and safer oil and gas operations. On the negative side, oil would have to be imported by tanker during the delay period and this would increase the risk of tanker accidents and, thus, a major oil spill. Such an oil spill, and its associated impacts, could outstrip all impacts due to drilling and production presently seen for the Gulf of Mexico.

A potentially significant impact would be loss of employment and business income by all companies, both large and small, which in turn would ultimately result in loss of personal income, government revenues and services to the community. The smaller companies could be affected the most since they operate as support industries to the larger companies, providing ancillary services and supplies. Likewise, many are subcontracted by larger companies for the major phases of production activities.

For these reasons, it is difficult to assess the actual employment impacts. However, the working base of men and capital for a larger company is much more flexible; they can more easily transfer their trained personnel and investment to other production areas. Smaller companies may not be able to withstand a loss of revenue or money which is unproductive because of a delay. This includes those smaller oil companies which engage in oil production and which have incurred expenses in pre-tract nomination activities. While all industry-related companies would be adversely affected by delaying the sale for an extended period of time, it appears that the smaller company would suffer the greater impacts.

Alternative "D" — Although no cancellation of a proposed sale has occurred in the Gulf of Mexico in over a decade, it has occurred in other OCS areas. The effects of a cancellation are very similar to those

which occur when a sale is delayed for an indefinite period. A basic difference is that delaying a sale is viewed as a postponement of production, while canceling this sale is a loss of a potential mean average of 27.1 million barrels of oil and 735 billion cubic feet of gas, with no extension of time involved.

It is estimated that a potential mean average of $1.5 billion of investment would occur as a result of holding this sale. Part of this investment occurs in pre-tract nomination activities, such as seismic data gathering, which is specific to the sale and which may be of no immediate value if the sale is canceled. The employment and income affects to smaller companies could be even more deleterious because of the complete loss of production.

The Reader is directed to section IV, Environmental Consequences, for further analyses of the impacts relative to each alternative.

PROPOSED DRAFT OUTLINE SALE NO. 62

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Section I

The Proposal

I. THE PROPOSAL

A. Purpose and Need for Action

Current energy demands are met by domestic and foreign fossil fuels, but continued dependence on foreign imports will heighten the inherent problems with that supply. The U.S. government has stated that increased domestic production will decrease our dependence on foreign oil and the resulting balance of payments deficit which weakens the American dollar. This goal is supported in President Carter's energy message of April 5, 1979.

To achieve energy independence, domestic petroleum production or alternative energy sources must be substituted for foreign oil imports. The Outer Continental Shelf (OCS) is an area where the Federal government can have a positive impact on domestic production. By holding lease sales of OCS lands, the government can encourage domestic exploration, development and production of oil and gas. This goal is stated in a Department of the Interior news release dated March 9, 1979, entitled "Draft Proposed Five-Year OCS Schedule Submitted to Governors." All these goals are delineated in Public Law 95-372, Amendments to the Outer Continental Shelf Lands Act (OCSLA). These amendments serve to establish a policy for the management of oil and natural gas on the OCS. Therefore, Congress, the President and the Department of the Interior have made oil and gas leasing an important governmental process, tool, vehicle or means of reducing dependence on foreign oil.

Of the alternatives proposed in this document, three will increase domestic petroleum production, and one presents the equivalent alternative energy resources necessary to replace the proposed action. Any of the proposed alternatives would replace an equivalent quantity of imported oil and assist in reaching the goal of energy independence.

B. Administrative Events Leading to Proposal

1. Legal and Administrative Background

By authority of the OCS Lands Act, as amended, BLM and GS are the primary agencies within DOI charged with administering mineral development on the OCS. When an oil and gas lease sale is proposed, this encompasses all activities connected with that sale from the Call for Nominations to the production of the OCS resource. BLM is responsible for implementing the leasing objectives of the Act through orderly and timely resource development, environmental protection, receipt of fair market return and to preserve and maintain free enterprise competition; GS provides resource estimates to BLM for use in their pre-sale evaluation. After the leases are issued, GS supervises and regulates exploration, development and production activities.

Leasing Process

The OCS leasing process consists of the nine major components listed below:

1) Proposed OCS Planning Schedule
2) Resource Reports from Appropriate Federal Agencies
3) Call for Nominations and Comments
4) Tentative Tract Selection
5) Environmental Analysis
6) Secretarial Issue Document
7) Pre-sale Evaluation
8) Lease Sale
9) Post-sale Analysis

The Planning Schedule covers a 5-year period, and provides for continuing and orderly development in all OCS areas of the continental United States (see figure 2). Review of the approved leasing program is conducted annually, and, as new or updated data is received, it is reviewed as to its affect on the total program. (A draft EIS was prepared on this Planning Schedule and made available to the public in the fall of this year.)

The other eight components consist of a series of steps involving data estimates from GS; input, coordination, and meeting with the states and the public relative to issues and goals; a call to the industry and the public for potential lease tracts to be included in the sale; analysis of the environmental consequences of the proposal; documentation to the Secretary, DOI, of EIS information and issues as a decision-making document; the actual sale; and analysis after the sale has been held.

Additionally, DOI is required to consult with other departments and agencies in many post-sale activities such as suspension and cancellation of leases (DOE), assignments (Attorney General), and pipeline rights-of-way (FERC/DOT).

2. Regulatory Framework

a. Changes Under the OCS Lands Act Amendments of 1978

The OCS Lands Act Amendments, Public Law 95-372, approved September 18, 1978, were enacted with respect to managing the resources of the OCS. The purposes of this Act are to:

(1) establish policies and procedures for managing the oil and natural gas resources of the OCS which are intended to result in expedited exploration and development of the OCS in order to achieve national economic and energy policy goals, assure national security, reduce dependence on foreign sources, and maintain a favorable balance of payments in world trade;

(2) preserve, protect, and develop oil and natural gas resources in the OCS in a manner which is consistent with the need (a) to make such resources available to meet the nation's energy needs as rapidly as possible, (b) to balance orderly energy resource development with protection of the human, marine, and coastal environments, (c) to insure the public a fair and equitable return on the resources of the OCS, and (d) to preserve and maintain free enterprise competition;

(3) encourage development of new and improved technology for energy resource production which will eliminate or minimize risk of damage to the human, marine, and coastal environments;

(4) provide states, and through states, local governments, which are impacted by OCS oil and gas exploration, development, and production with comprehensive assistance in order to anticipate and plan for such impact, and thereby to assure adequate protection of the human environment;

(5) assure that states, and through states, local governments, have timely access to information regarding activities on the OCS, and opportunity to review and comment on decisions relating to such activities, in order to anticipate, ameliorate, and plan for the impacts of such activities;

(6) assure that states, and through states, local governments, which are directly affected by exploration, development, and production of oil and natural gas, are provided an opportunity to participate in policy and planning decisions relating to management of the resources of the OCS.

(7) minimize or eliminate conflicts between the exploration, development, and production of oil and natural gas, and the recovery of other resources such as fish and shellfish;

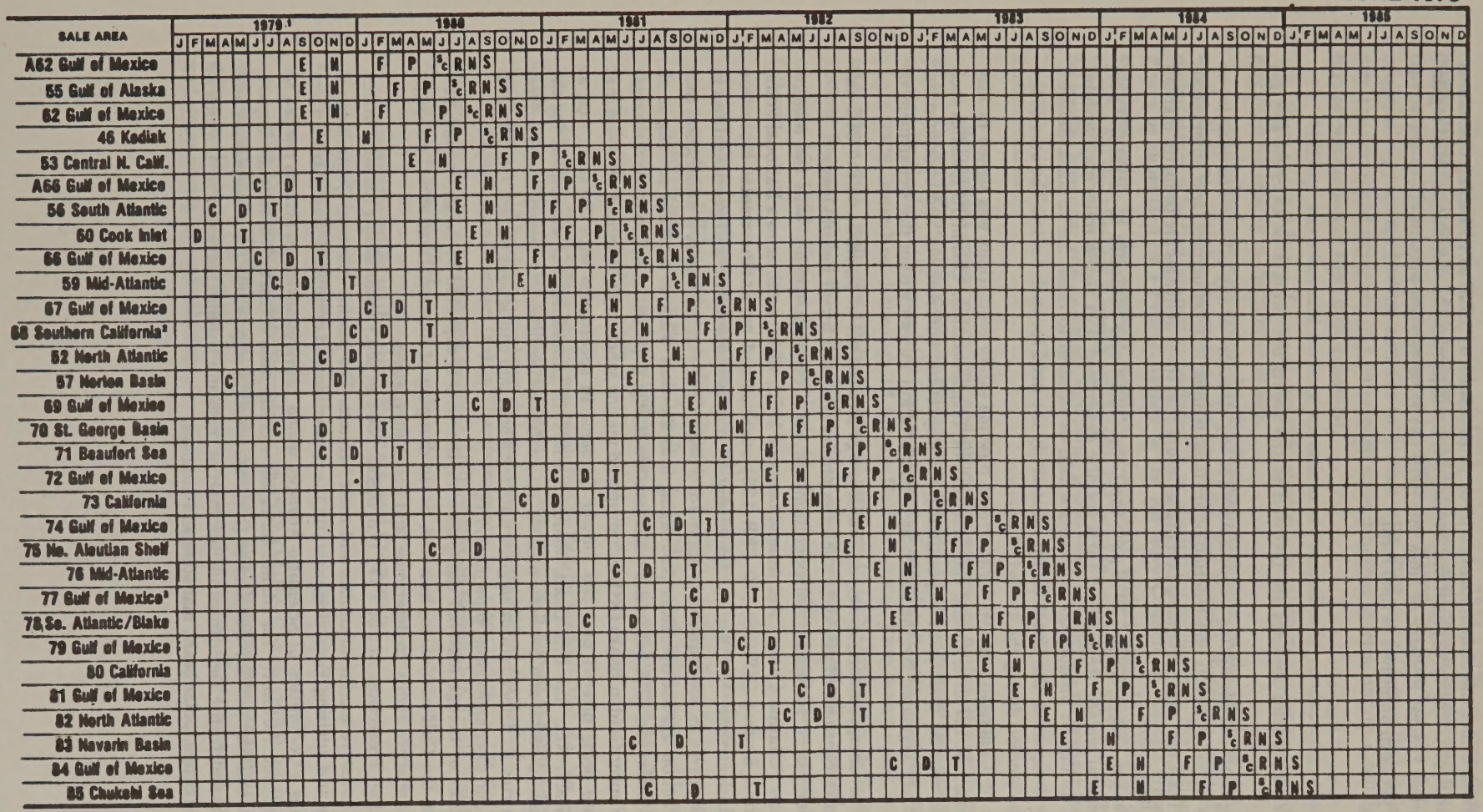
(8) establish an oilspill liability fund to pay for the prompt removal of any oil spilled or discharged as a result of activities on the OCS and for any damages to public or private interests caused by such spills or discharges;

(9) insure that the extent of oil and natural gas resources of the OCS is assessed at the earliest practicable time;

(10) establish a fishermen's contingency fund to pay for damages to commercial fishing vessels and gear due to OCS activities.

PROPOSED OCS OIL AND GAS LEASE SALE SCHEDULE

JUNE 1979



C — Call for Nominations
D — Nominations Due
T — Tentative Tract Selection
E — Draft Environmental Statement
H — Public Hearing
S — Sale
F — Final Environmental Statement
P — Proposed Notice of Sale
SC — State Comments Due
R — Energy Review
N — Notice of Sale

FIGURE 2. PROPOSED SCHEDULE

[1]The 1979 Column is included to indicate the pre-lease actions required for OCS lease sales scheduled for the period 3/80-2/85. Sales scheduled for dates in the latter half of 1979 include:
49 So. California — June 1979
58 Gulf of Mexico—July 1979
42 North Atlantic—Oct. 1979
58A Gulf of Mexico—Nov. 1979
Beaufort Sea — Dec. 1979

[2]Includes Santa Barbara Channel.

[3]This sale has been included in this schedule in order that planning may be commenced. Subsequent events (e.g., deletion of another sale from this schedule) will determine whether this sale will be held as indicated, held at some other time during the 5-year period, deleted or postponed until after February 1985.

Pertinent regulations under the Amendments will be those issued by BLM as to leasing operations and to pipelines, and those of GS as to exploration, development and production operations. BLM regulations were published in the Federal Register of June 29, 1979 (44 CFR 382.68) effective July 30, 1979. GS regulations have not yet been published in final form.

b. Authorities of Other Federal Agencies

Besides BLM, other Federal agencies are involved in the regulatory process of OCS oil and gas operations.

The Corps of Engineers has permitting responsibility for any structure or any other work done in, or affecting, U.S. navigable water, as well as construction of artificial islands, fixed structures, and other installations on the the OCS. The Coast Guard requires permits to insure that these activities are properly marked and have lighted aids to navigation.

The Port and Tanker Safety Act of 1978 gave the Coast Guard new authority to establish "port access routes" in U.S. coastal waters. Regulations for a specific designated port access route may prohibit or restrict placement of drilling or production platforms within or adjacent to vessel traffic lanes. Before a port access route can be designated, the Coast Guard must study the need for such routes. The area of the proposed lease sale will be studied during the 1979-1980 period.

A Memorandum of Understanding (MOU) regarding pipeline safety regulations was signed in May 1976 between the Secretary of the Interior and the Secretary of Transportation. This MOU specifies each agency's responsibility as well as their joint responsibility for inspection, enforcement and coordination. Pipeline safety is ultimately regulated by the Materials Transportation Bureau within the Department of Transportation.

The Department of Energy, among its responsibilities, regulates the use of pipelines on the OCS and sets the wellhead price of OCS-produced gas, and establishes production rates for all Federal leases.

USGS OCS Order No. 7 stipulates that operations on the OCS must comply with the requirements of the Federal Water Pollution Control Act Amendments of 1972, which establishes a National Pollution Discharge Elimination System (NPDES) (40 CFR 125) administered by Environmental Protection Agency (EPA). At the present time, EPA has not issued any NPDES permits for oil and gas operations in the Gulf even though all operators are required to apply for a permit prior to drilling. It is understood that EPA will not take any action against operators discharging into the Gulf without a permit so long as all DOI regulations are met; however, EPA has under consideration stringent permit conditions for discharges near the East and West Flower Garden Banks (NOAA's proposed marine sanctuary). It should be noted that for this sale no tracts are being offered near the Flower Gardens. In accordance with the same Act, as amended by the Clean Water Act, the U.S. Coast Guard approves the procedures and equipment for the transfer of oil from vessel to vessel and between onshore and offshore facilities and vessels and conducts pollution surveillance patrols to detect oil discharges within territorial and contiguous waters. GS performs surveillance for oil spills and discharges along pipeline routes.

The EPA regulation of dredge material dumpsites on the OCS is expected to be an ongoing process at designated sites in the Gulf of Mexico; however, ocean dumping of industrial wastes will no longer be permitted in view of industry's ability to determine land based alternatives.

The Marine Mammal Protection Act of 1972 (16 U.S.C. 1361 et seq.) establishes a national policy designed to protect and conserve marine mammals and their habitats. The Marine Mammal Commission is responsible for reviewing and advising Federal agencies on the protection and conservation of marine mammals. The Commission has a Committee of Scientific Advisors which provides advice on actions needed to fulfill the purposes of the Act. Authority for administering the Act has been delegated to both the Department of Commerce, National Marine Fisheries Service (NMFS), which is responsible for all cetaceans and pinnipeds (except walrus) and to the Department of the Interior, Fish and Wildlife Service (FWS), which is responsible for walrus, sea otters, polar bears, manatees and dugongs.

The Endangered Species Act of 1973 (16 U.S.C. 1531-1543), as amended, establishes a national policy designed to protect and conserve threatened and endangered species and the ecosystem upon which they depend. This Act is administered by FWS and NMFS. Section 7 of the Act, governing interagency cooperation, requires Federal agencies to consult with FWS and to insure that their actions do not jeopardize the continued existence of a threatened or endangered species, and/or result in the adverse modification or destruction of their critical habitat.

Military exercises and training operations are periodically conducted in the Gulf of Mexico by the U.S. Navy and Air Force. Gunnery, aircraft, missile, and submarine exercises may be conducted over areas proposed for leasing in this proposed sale.

All Federal agencies involved in leasing and permitting on the OCS are required under Section 106 of the National Historic Preservation Act to ensure that Federal, Federally assisted and Federally licensed undertakings affecting properties included in or eligible for inclusion in the National Register of Historic Places be submitted by a Federal agency to the Advisory Council on Historic Preservation for review and comment prior to the agency's approval of any such undertaking. In order to determine if properties eligible for the National Register will be affected by proposed action, E.O. 11593 requires Federal agencies to locate, inventory and nominate properties under their jurisdiction or control to the National Register.

c. OCS Orders

Regulations governing drilling and producing operations on the OCS are found in Title 30, Part 250 of the Code of Federal Regulations and are administered by the Conservation Divison, GS. They are supplemented by Geological Survey OCS Orders which deal specifically with problems unique to a certain area.

OCS Order Nos. 1 through 14 for the Gulf of Mexico have been printed in the Draft EIS for Sale 58A. Since that Draft, the GS has published revisions to OCS Orders Nos. 1, 2, 3, 4, 5, 7 and 12 in the Federal Register, Vol. 44, No. 98, Friday, May 18, 1979, with an effective date of July 1, 1979. However, on June 15, 1979, Federal Register Vol. 44, No. 117, published an amendment to OCS Order No. 5 as follows:

> "All subsurface- and surface-safety valves installed on new installations or replaced by existing OCS installations after February 1, 1980, shall conform to the requirements of ANSI/ASME SPPE-1-1977. After July 1, 1979, all such valves ordered from manufacturers for installation after February 1, 1980 shall conform to the requirements of ANSI/ASME SPPE-1-1977."

On June 29, 1979, a notice was published in Federal Register, Vol. 44, No. 127, that all OCS Orders would have their effective dates extended to October 1, 1979 due to numerous requests for a delay until the impacts could be determined and the necessary implementation completed.

Copies of the revised Orders, the amendments and maps indicating the jurisdictional boundary are available from the Conservation Manager, Gulf of Mexico Region, U.S. Geological Survey, P. O. Box 7944, Metairie, Louisiana 70011.

C. Interrelationship with Other Projects and Proposals

1. Coastal Zone Management

The Coastal Zone Management Act of 1972 (16 U.S.C. 1451-1464), as amended, administered by the Department of Commerce, National Oceanic and Atmospheric Administration (NOAA), provides grants-in-aid to states for the development and implementation of management programs to control land and water uses in the coastal zone.

Amendments to the Act, adopted in 1976, provide that states which are preparing a management program under Section 305 of the Act may receive supplementary grants and loans to ameliorate environmental and recreational losses within the coastal zone resulting from OCS and other energy development activities.

The Act requires that Federal actions within or directly impacting the coastal zone be consistent with a state's program once that program has been approved by the Secretary of Commerce, and that state plans must consider the national interest in energy facilities sitings. Local governments, in turn, must consider state and regional interests in the exercise of their regulatory powers in the coastal zone.

The affected states adjacent to the proposed OCS sale area--Texas, Louisiana, Mississippi, Alabama and Florida--have received planning grants and are preparing programs for submission to the Secretary of Commerce. At their present stage of development, these programs do not propose any additional restrictions on OCS activities resulting from this proposed sale.

2. Estuarine and Marine Sanctuary Programs

NOAA is responsible for the National Estuarine Sanctuary and the National Marine Sanctuary Programs. These sanctuaries would provide special protection to designated unique habitats or resources in the marine environment.

The Marine Protection Research and Sanctuaries Act of 1972 (16 U.S.C. 1431-1434) authorized the creation of estuarine sanctuaries. Although this program is administered by the Office of Coastal Zone Management (OCZM), in NOAA, any area designated as a National Estuarine Sanctuary would be owned and managed by the appropriate state which may cooperate with local government, and other public or private institutions or organizations. No national estuarine sanctuaries have been established in the planning region under consideration for this proposal; however, a draft environmental impact statement has been written on a proposal to designate one in the Apalachicola, Florida area, just to the east of the area covered by this proposed sale.

Under the Marine Protection, Research and Sanctuaries Act, OCZM is responsible for administering the Marine Sanctuaries Program. Areas designated in this system are managed at the Federal level. Although no areas within the planning region of this proposal have been designated to date, several nominated areas are currently being evaluated. A DEIS has been written and is under review by the Department of Commerce on a proposal to designate the area of the East and West Flower Garden Banks as a marine sanctuary. A five year moratorium on all oil and gas activities on blocks not leased at the time of the designation has been included in that proposal. It should be noted that no tracts in this proposed sale are within the area currently under consideration for the sanctuary. The DEIS presents the rationale for designating this proposed marine sanctuary on the OCS offshore Texas and Louisiana. To protect the distinctive values of the Flower Garden Banks, the following activities would be regulated by the Secretary of Commerce within 4 nautical miles of the 100 m isobath, an area of approximately 225 square miles:

(1) Removing, breaking or otherwise deliberately harming coral bottom formations or marine invertebrates or plants, or taking tropical fish, except incidentally to other fishing operations.

(2) Operations of vessels other than fishing vessels, including anchoring and navigation, and anchoring by fishing vessels.

(3) Dredging, or altering the sea bed in any manner.

(4) Construction.

(5) Discharging or depositing any substance or object.

(6) Using poisons, electric charges, spearguns or explosives.

(7) Trawling or dragging bottom gear within the 100 m isobath.

The DEIS on the proposal was made available on April 12, 1979; proposed regulations that would apply if the area were designated were published in the Federal Register (44 FR 22081-22088) on April 13,

1979. The proposal would apply more restrictions to a larger area than are currently applied by DOI regulations and lease stipulations. DOI maintains that currently applied regulations and stipulations are adequate to protect the living resources of the area while at the same time recovering the oil and gas resources. Public Hearings have been held on the designation of this marine sanctuary and regulations promulgated to protect the sanctuary; formal consultations with the Secretaries of State, Defense, Interior, and Transportation, the Administrator of the Environmental Protection Agency, and other interested Federal agencies are in progress. Approval by the President must occur before designation by the Secretary of Commerce.

3. Marine Fisheries Management

The Fishery Conservation and Management Act (FCMA) of 1976 (16 U.S.C. 1801-1882) established a 200-mile fisheries conservation zone off the coasts of the United States and its possessions, effective March 1, 1977. It is an Act applicable to fishing and all its purposes, policies and standards apply specifically to fishing and the division and control of fish resources.

The Act provided for creation of eight Regional Fisheries Management Councils to be composed of fishermen and other interested individuals, representatives of states, and Federal interests responsible and concerned with commercial and recreational fisheries in the marine environment. This Act mandates a continuing planning program to be initiated by the Councils. A highly detailed plan, based upon the best available scientific and economic evidence, must be prepared for each species (or related group of species) of fish harvested within each respective region. These plans are called Fishery Management Plans (FMP) and each plan requires approval by the Secretary of Commerce prior to the issuance of regulations to implement it. These plans generally regulate the level and method of catch, both by domestic and foreign fishermen. The plans may close areas to fishing, which the stone crab plan has done. These areas closures concern only fishing and not other users of the OCS like shipping and oil and gas. Given staff and funding limitations and regional and national priorities, some low priority, but nonetheless significant, species may not have plans completed for them for 5-10 years or more.

The Gulf of Mexico Fishery Management Council will develop the fisheries plans for the Fishery Conservation Zone which roughly corresponds to the offshore area under consideration for Proposed Sale 62.

As of June 1979, the only FMP for the Gulf of Mexico which has been implemented is the stone crab plan; however, the abundance of these animals is mainly concentrated east of Franklin County, Florida which is not in the proposed sale area. Additional plans under consideration and scheduled for completion in 1980 are reef fish (snapper-grouper), groundfish, coastal pelagics (mackerel), sharks, spiny lobster, shrimp and coral. Except for spiny lobster, the aforementioned resources are abundant in the proposed sale area. Discussions of fisheries are in sections II.A.2.e. and III.D.6.

4. Intergovernmental Planning Program

The Intergovernmental Planning Program for OCS Oil and Gas Leasing, Transportation and Related Facilities is being implemented to provide a formal coordination and planning mechanism for three major OCS program elements administered by BLM. These are (1) the leasing process, (2) the Environmental Studies Program, and (3) transportation planning for OCS oil and gas. This program will apply specifically to those activities which fall within the purview of BLM and does not affect existing authorities and responsibilities.

The program establishes a Policy Committee, a Scientific Committee, and in each of the six leasing regions, a Regional Technical Working Group Committee. If a marketable discovery is made, a State Technical Working Group Subcommittee is also established. The Policy Committee advises relative to discretionary functions, including all aspects of OCS exploration and development of resources. The Regional

Technical Working Group Committees provide guidance to BLM and information to other Interior bureaus through the acquisition and evaluation of information. The State Technical Working Group Subcommittees serve as forums for information exchange for sitespecific planning activities, the establishment of transportation corridors and the location of associated onshore facilities. The Scientific Committee advises relative to the feasibility, appropriateness and scientific value of BLM's Studies Programs.

D. Environmental Studies

BLM-funded scientific investigations are being conducted throughout the Gulf of Mexico OCS to obtain data that may be used in evaluation of this and future offshore leasing proposals (see visuals 12 and 12E).

BLM has established broad objectives for the environmental studies program in order to satisfy various legislative requirements, including those of the Outer Continental Shelf Lands Act, as amended, and the National Environmental Policy Act. These objectives are: (1) acquisition of information about the OCS environment that will enable DOI and BLM to make better management decisions regarding the development of mineral resources on the OCS; (2) acquisition of information about the OCS environment which will enable DOI and BLM to assess the impacts of OCS oil and gas exploration and development on the marine environment, and information which will enable the detection of environmental changes which may occur as a result of oil and gas operations; (3) establishment of a basis for prediction of impact of OCS oil and gas activities in frontier areas; (4) identification of sensitive habitats, potential geological hazards, and other factors of concern on the marine environment; and (5) acquisition of impact data that may result in the modification of leasing stipulations, and OCS Operating Orders, Notices to Lessees and guidelines permitting efficient resource recovery while also insuring the protection of the marine environment.

The environmental studies program was started in 1974 and included mapping and submersible reconnaissance of 16 topographic highs on the Texas OCS which has since been completed. The reconnaissance allowed for visual (operators' reports, videotape and still photographs) characterization of these sites as potentially valuable resources (commercial fish havens, reefs or reef-type communities). Biological and geological sampling was also conducted. Much of this information was utilized in the promulgation of lease stipulations. In the second year further intensive submersible observations and standard oceanographic measurements were taken at Southern Bank and Hospital Rock. Bathymetric mapping has been completed for East Flower Garden, Stetson and an unnamed bank. Submersible reconnaissance has been conducted at the Stetson, East Flower Garden, Twenty-eight Fathom Bank and the adjacent unnamed bank. This work was conducted on this latter group of banks in order to precede anticipated drilling activity. In the third year, bathymetric mapping was completed for Sonnier Bank, Bouma Bank, Parker Bank, 18 Fathom Lump, Ewing Bank, Sackett Bank, and one unnamed bank; submarine reconnaissance for biological and geological characterization of each bank was performed. Additionally, seasonal monitoring studies are continuing at the East Flower Garden Bank; these studies will be performed using submarine and scuba diving efforts and shipboard sampling.

A special study entitled "Compilation and Summation of Historical and Existing Physical Oceanographic Data from the Eastern Gulf of Mexico" summarized available data of the Gulf of Mexico Loop Current, West Florida Shelf Currents, meteorological factors affecting the oceanographic conditions, river runoff effects in the MAFLA (Mississippi, Alabama and Florida) area, remote sensing data and the results of several drift bottle releases in the Gulf of Mexico. This information has been utilized in the planning and development of present and future studies in the MAFLA area. In addition, it has provided substantive information on the evaluation of potential areas of impact.

A third special study, partially funded by BLM, attempted to develop the capacity to predict currents in the Gulf of Mexico for use in pollutant trajectory computations. This study adequately modeled the deep Gulf; however, it failed to describe the shelf currents. Further attempts to model the OCS were delayed. Other Federal agencies, NOAA, FWS, EPA and DOE also are conducting studies in the Gulf of Mexico.

The following is a list of study titles which have been or will be funded in 1979 in the Gulf of Mexico (as of June 1979):

(1) Investigation of the Effects of OCS Development on Onshore Endangered Species Including Manatees
(2) FWS Coastal Characterization and Ecological Mapping
(3) Effects of OCS Oil and Gas Activities on Reef Fish
(4) Northern Gulf of Mexico Topographic Features
(5) Gulf of Mexico Geological Mapping—Mississippi Delta Slope Stability Study
(6) Bathymetric Mapping—1:250,000 (see visual 9)

E. Description of the Proposal

1. Location and Resources

Proposed Sales A62 and 62 will offer 296 tracts totalling 1,517,787 acres in Federal waters offshore Texas, Louisiana, Mississippi, Alabama, and Florida. These tracts range from 3 to 104 nautical miles (6 to 198 km) offshore and 4 to 700 meters in depth. Individual tract locations are shown on visuals 1 and 1E, figure 1 and in Appendix A.

Probabilistic resource estimates for the proposed action are shown in table 1.

2. Basic Development Assumptions

Given the resource estimates in table 1 (Part A), development and costs incurred are expected as given in Parts B and C. (Activities are described in FEIS 58A, Section I.A.3.) Table 2 provides an estimated development timetable.

Based on these tables, statistical data on past spills, and scenarios considered reasonable and appropriate for environmental impact assessment, several development assumptions were made by GS and BLM:

(1) no additional onshore support facilities or refineries would be necessary;

(2) a maximum of three onshore terminals or storage facilities would be located in the vicinities of Corpus Christi, Texas (just north of Padre Island National Seashore), Caillou, Louisiana (between Houma and Morgan City), and Navarre, Florida (between Pensacola and Panama City);

(3) a maximum of three pipeline landfalls located in those same areas, with a total mileage ranging from 100 to 450 miles; and,

(4) one major oil spill greater than 1,000 barrels during sale production (excepting the Texas tract area which is gas prone).

— For purposes of analysis this major spill is assumed to occur at either of two locations: the Destin Dome Area about 35 miles south of Fort Walton Beach, Florida; or in an area about 30 miles off the central Louisiana coast, in the Eugene Island Area.

— Between 1 and 2 minor oil spills averaging less than 100 barrels, randomly distributed among the oil prone lease sale tracts, are assumed to occur annually.

The environmental consequences section is based on these assumptions.

3. Issues

Based on the scoping and coordination meetings, with Federal and non-Federal government agencies as well as with the public, as discussed in the Summary Section, an assessment was made of the potential

Table 1

Summary of Resources and Development

	5%	Percentage Mean	95%
A. RESOURCES			
1. Total Production			
a. Oil (million barrels)	16.4	27.1	49.2
b. Gas (trillion cubic ft.)	.422	.735	1.04
2. Daily Peak Production			
a. Oil (barrels)	8,000	14,000	20,000
b. Gas (million cubic ft.)	180	300	440
B. DEVELOPMENT			
1. Wells			
a. Exploratory	60	110	225
b. Delineation	60	110	225
c. Development	60	100	150
2. Platforms	10	16	30
3. Subsea Completions	1	5	7
4. Pipelines (miles)	100	200	450
5. Terminals/Storage	1	2	3
C. COSTS (MILLION $)			
1. Wells			
a. Exploratory	$ 100	$ 200	$ 350
b. Delineation	100	200	350
c. Development	65	110	160
2. Platforms	435	850	1,300
3. Subsea Completions	1	5	7
4. Pipelines	60	120	270
5. Terminals/Storage	5	10	15
TOTAL	$ 766	$1,495	$2,452

Source: USGS, 1979.

Table 2

Estimated Development Timetable (5%-M-95%)

	Exploratory	WELLS Delineation	Development	Platforms	Subsea Completions	Pipelines (Miles)	Terminals/ Support	Beginning Production
1982	6-11-22	6-11-22	0- 0- 5	0-0-1		0- 0- 9		2%
1983	12-22-45	12-22-45	5-10-15	1-2-3		10-20-20		10%
1984	18-33-70	18-33-70	5-10-15	1-2-3		10-20-45		20%
1985	12-22-45	12-22-44	5-10-15	1-2-5		10-20-45		30%
1986	12-22-45	12-22-45	10-15-20	2-3-5	1-2-2	10-20-45		40%
1987			15-20-30	2-3-6	0-2-2	10-20-45	0-1-1	50%
1988			15-20-30	3-4-7	0-1-3	20-40-90	0-0-1	70%
1989			5-15-20			30-60-135	0-0-1	90%
1990								100%
TOTAL	60-110-225	60-110-225	60-100-150	10-16-30	1-5-7	100-200-450	0-1-3	

Source: USGS, 1979.

environmental impacts which would result if this proposed sale were held. The whole range of impacts was addressed and resulted in a Summary of Impact Assessment which is listed as Appendix B.

It should be noted that each potential impact was methodically analyzed and factored according to set criteria. As a result, eight impacts were deemed to be significant enough to address in Alternative A, Hold the Sale. They are:

1) Impact on Multiple Use Area
2) Impact on Employment
3) Impact on Air Quality
4) Impact on Water Quality
5) Impact on Fisheries Resources
6) Impact on Endangered Species
7) Impact on Shoreline Recreational Resources
8) Impact on Recreational Fishing

Of Alternative B, Modify the Sale via Tract Deletions, only Modifications B-2 (Multiple Use Area) and B-6 (Buffer Zone Tracts) would have an impact on endangered species and recreation. If the sale were delayed, (Alternative C) the impacts would also be delayed; however, foreign importation of oil would probably occur and increase the risk of oil spill. Economic activities will also be affected due to rising inflation. If the sale were cancelled, (Alternative D) both employment and recreation would be affected.

These issues were assessed using the assumptions as outlined in Section I.E.2. above.

4. Mitigation Via Lease Stipulations

Oil and gas exploration and development activities have the potential for causing negative environmental impacts; therefore, stipulations are attached as an additional mitigating measure to those already in place, as necessary, to any tract which is considered to have the potential for such harm.

Many different types of stipulations can be attached, but for this proposed sale four types of stipulations will be necessary. They are the Biological, Cultural Resources, Geologic Hazards and Military Area stipulations, and are detailed below. These will apply to all tracts unless otherwise stated; the term "Supervisor" refers to the Oil and Gas Supervisors for the Gulf of Mexico Operations of the U.S. Geological Survey, and "Manager" refers to the Manager, New Orleans OCS Office of the Bureau of Land Management.

a. Biological Stipulation

Oil and gas exploration and development activities have the potential for causing severe harm to certain productive and unique biological communities found on hard bottom areas and areas of significant topographical relief (These communities are discussed in Section III.B.2.). Stipulations have been developed to protect these communities from adverse impacts due to oil and gas activities and will be made a part of any lease resulting from this proposed sale which is on or sufficiently close to an area of biological significance upon which the biota of that area might be adversely affected by oil and gas exploration and development.

These stipulations have been developed during the past five years in consultation and coordination with the FWS and GS. In addition, advice has been received from other agencies, such EPA and NMFS as well as from the industry and other interested groups. Finally, in designing these stipulations, extensive use has been made of BLM funded studies in the area as well as industry funded studies, including those monitoring studies required by lease stipulations (i.e., Bright and Rezak, 1976, 1978a, 1978b; Mobil, 1975; other industry funded monitoring reports may be examined in the New Orleans OCS Office).

In general, there are four types of biological stipulations applied in the Gulf of Mexico (it must be recognized, however, that specific tracts may have a stipulation imposed which will vary in some details, depending on the conditions prevailing in that area):

1. Stipulations in the area of the East and West Flower Garden Banks are the most stringent because of the unique and sensitive nature of these coral reefs. These stipulations:

a. prohibit any activity, including the placement of pipelines, within the 85 m isobaths of the Banks;

b. require the shunting of all drilling fluids and cuttings to within 10 m of the bottom for activities within 3 nautical miles (nmi) of the 85 m isobath; and

c. require a monitoring program to assess the impacts of the activities as the biota of the Banks to be carried out for activities within 1 nmi of the 85 m isobath.

It should be noted that there are no tracts offered in this proposed sale which are in the area of the Flower Gardens.

2. Stipulations for leases on or near banks near the shelf break of the central and western Gulf which rise within 85 m of the surface water are somewhat less stringent but still serve to protect the biota of the bank. Again, all activities within the 85 m isobath are prohibited (for those banks in water shallower than 85 m, a closing isobath would be selected so that protection of the bank would be maintained); within 1 nmi of the 85 m isobath, shunting is required; and between 1 nmi and 3 nmi of the 85 m isobath either shunting or monitoring would be required, and if monitoring showed that not shunting was harming the biota of the bank, shunting could be imposed. Twelve tracts of this proposal will be affected by these requirements: 62-69, A62-53 through A62-57, A62-62, A62-104 and A62-133 through A62-136.

3. There are several banks, particularly off the South Texas coast, which have less relief, which rise from water shallower than those mentioned above, which are subjected to a much higher level of turbidity and sedimentation, and upon which the biotic communities are less diverse and productive. These banks receive adequate protection by a stipulation prohibiting any activity within the boundary of the bank itself, which will usually be the deepest closing isobath of the bank. No tracts of this proposed sale will be affected by this stipulation.

4. There are areas in the eastern Gulf, having sea floors characterized by sparsely distributed rocky outcrops a few meters in relief. These "live bottom areas" (described in more detail in Section II.B.9. of the FES for Sale 65) contain biological assemblages consisting of sessile flora and fauna which tend to attract or accumulate turtles and fish; such areas are richer and more diverse and productive than the surrounding sea bottom and thus considered worthy of protection from the potential adverse impacts of oil and gas activities. These areas are not well known or mapped; thus, the stipulation applied in areas where live bottoms might occur may require the lessee to provide a bathymetry map of the area in which drilling is desired and will require the lessee to make an interpretation of any survey data (their own or the government's) for the possible presence of live bottom areas, and if the data indicates that live bottoms might exist in the area, the lessee will be required to submit photo or other documentation to substantiate that such areas are not present. If it is determined that drilling may take place in the area despite the presence of live bottom, the lessee will be required to take measures designed to protect the live bottom, which may include (but are not limited to) shunting, monitoring, or the transporting of all drilling effluents away from the live bottom area. There are 37 tracts affected by this stipulation (Destin Dome Area Tracts A62-185 through A62-221).

In order to accomplish the protection described above, the following specific stipulations will be made a part of any lease that might result from this proposed sale for the tracts indicated.

1. *Biological Resources Protection for Sonnier Banks.* (To be included only in leases resulting for Tracts A62-53, A62-54, A62-55, A62-56 and A62-57.)

a. No structures, drilling rigs, or pipelines will be allowed within the 55 m isobaths of Sonnier Banks.

b. Operations within the areas shown as "1 Mile Zone" in figure 3 shall be restricted by shunting all drill cuttings and drilling fluids to the bottom through a downpipe that terminates an appropriate distance, but no more than ten meters, from the bottom.

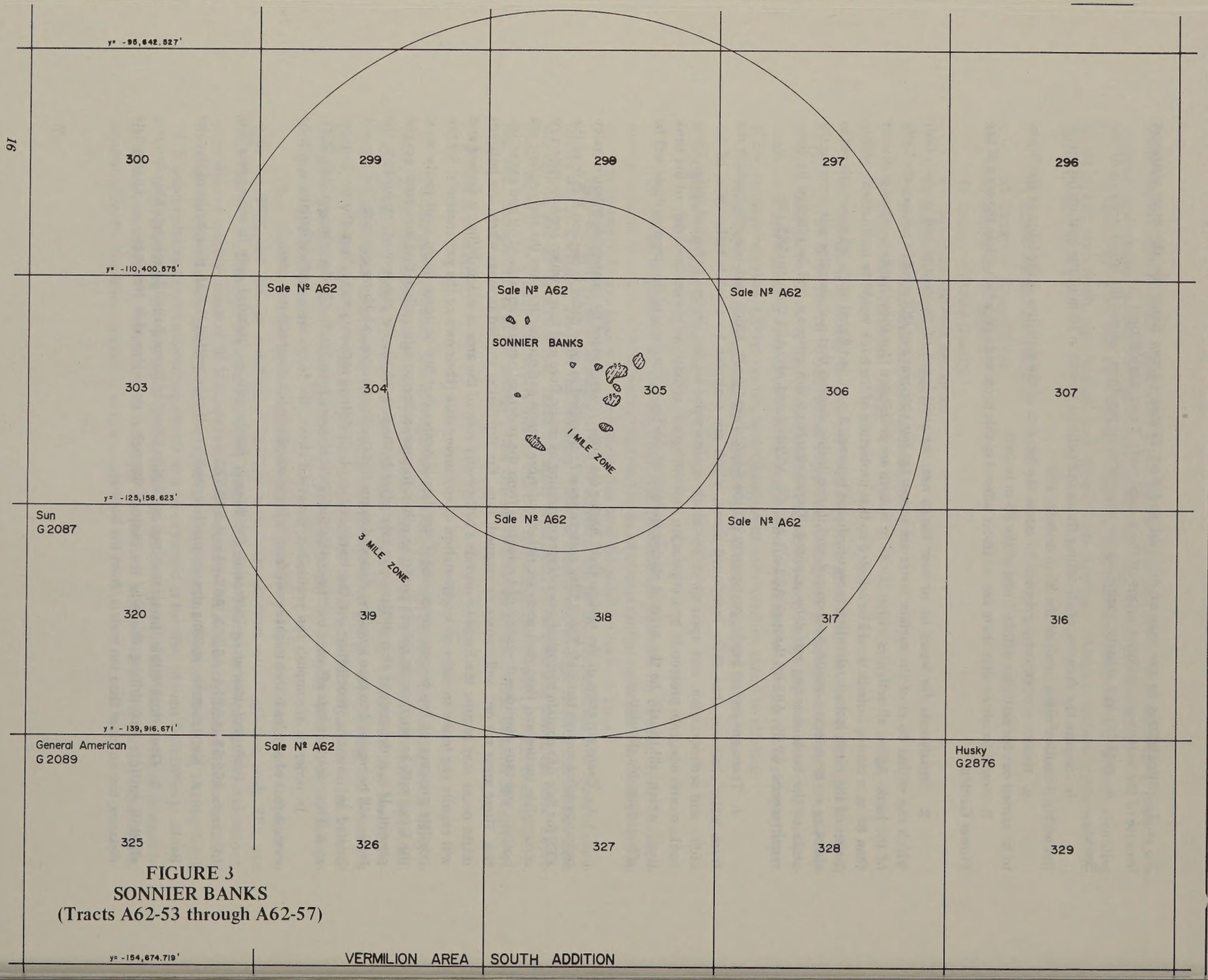


FIGURE 3
SONNIER BANKS
(Tracts A62-53 through A62-57)

c. Operations within the area shown as "3 Mile Zone" in figure 3 shall be restricted as specified in either (1) or (2) below at the option of the lessee.

(1) All drill cuttings and drilling fluids must be disposed of by shunting the material to the bottom through a downpipe that terminates an appropriate distance, but no more than ten meters, from the bottom.

(2) The operator (lessee) shall submit a monitoring plan as part of the exploration and development and production plans. The monitoring plan will be designed to assess the effects of oil and gas exploration and development operations on the biotic communities of the nearby banks.

The monitoring program shall indicate that the monitoring investigations will be conducted by qualified independent scientific personnel and that these personnel and all required equipment will be available at the time of operations. The monitoring team will submit its findings to the Supervisor on a schedule established by the Supervisor, or immediately in case of imminent danger to the biota of the bank resulting directly from drilling or other operations. If it is decided that surface disposal of drilling fluids or cuttings presents no danger to the bank, no further monitoring of that particular well or platform will be required. If, however, the monitoring program indicates that the biota of the bank is being harmed, or if there is a great likelihood that operation of that particular well or platform may cause harm to the biota of the bank, the Supervisor shall require shunting as specified in (1) above or other appropriate operational restrictions.

2. *Biological Resources Protection for Rezak Bank.* (To be included only in the lease resulting from this proposed sale for Tract A62-62.)

Operations within the area shown as "3 Mile Zone" in figure 4 shall be restricted as specified in either (a) or (b) below at the option of the lessee.

a. All drill cuttings and drilling fluids must be disposed of by shunting the material to the bottom through a downpipe that terminates an appropriate distance, but no more than ten meters, from the bottom.

b. The operator (lessee) shall submit a monitoring plan as part of the exploration and development and production plans. The monitoring plan will be designed to assess the effects of oil and gas exploration and development operations on the biotic communities of the nearby banks.

The monitoring program shall indicate that the monitoring investigations will be conducted by qualified independent scientific personnel and that these personnel and all required equipment will be available at the time of operations. The monitoring team will submit its findings to the Supervisor on a schedule established by the Supervisor, or immediately in case of imminent danger to the biota of the bank resulting directly from drilling or other operations. If it is decided that surface disposal of drilling fluids or cuttings presents no danger to the bank, no further monitoring of that particular well or platform will be required. If, however, the monitoring program indicates that the biota of the bank is being harmed, or if there is a great likelihood that operation of that particular well or platform may cause harm to the biota of the bank, the Supervisor shall require shunting as specified in (a) above or other appropriate operational restrictions.

3. *Biological Resources Protection for Diaphus Bank.* (To be included only in the lease resulting from this proposed sale for Tract A62-104.)

Operations within the area shown as "3 Mile Zone" in figure 5 shall be restricted as specified in either (a) or (b) below at the option of the lessee.

a. All drill cuttings and drilling fluids must be disposed of by shunting the material to the bottom through a downpipe that terminates an appropriate distance, but no more than ten meters, from the bottom.

b. The operator (lessee) shall submit a monitoring plant as part of the exploration and development and production plans. The monitoring plan will be designed to assess the effects of oil and gas exploration and development operations on the biotic communities of the nearby banks.

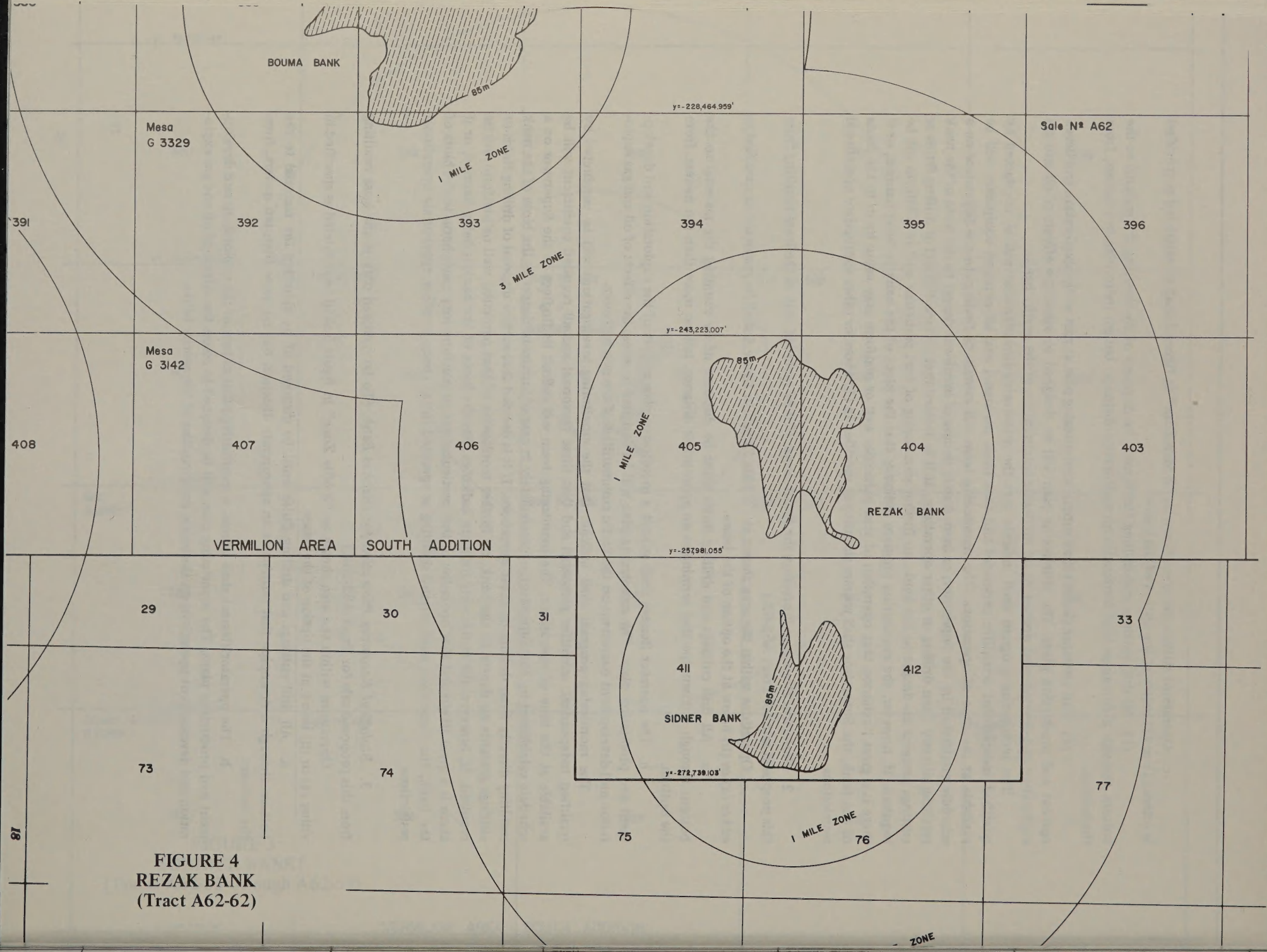


FIGURE 4
REZAK BANK
(Tract A62-62)

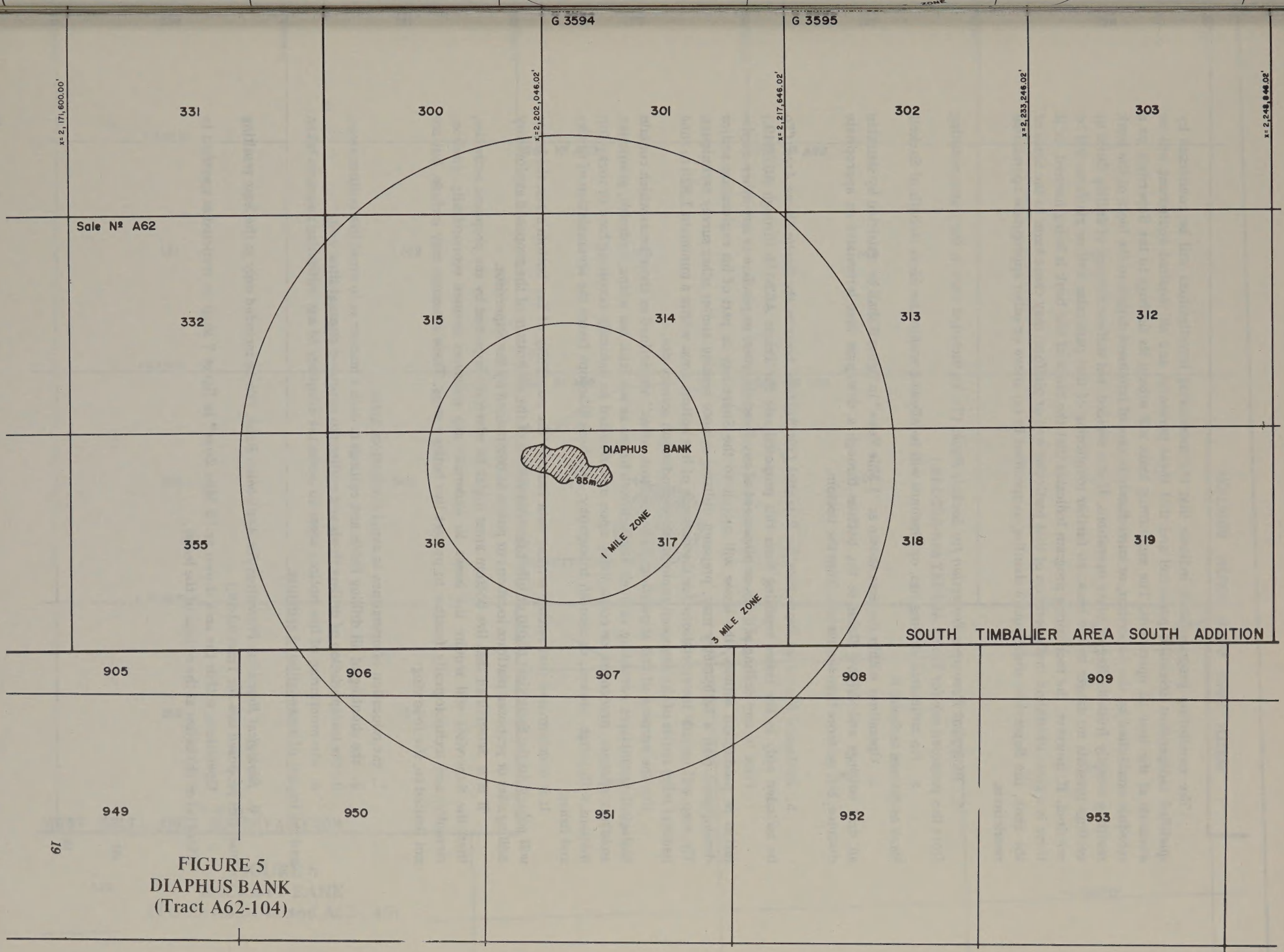


FIGURE 5
DIAPHUS BANK
(Tract A62-104)

The monitoring program shall indicate that the monitoring investigations will be conducted by qualified independent scientific personnel and that these personnel and all required equipment will be available at the time of operations. The monitoring team will submit its findings to the Supervisor on a schedule established by the Supervisor, or immediately in case of imminent danger to the biota of the bank resulting directly from drilling or other operations. If it is decided that surface disposal of drilling fluids or cuttings presents no danger to the bank, no further monitoring of that particular well or platform will be required. If, however, the monitoring program indicates that the biota of the bank is being harmed, or if there is a great likelihood that operation of that particular well or platform may cause harm to the biota of the bank, the Supervisor shall require shunting as specified in (a) above or other appropriate operational restrictions.

4. *Biological Resources Protection for Sackett Bank.* (To be included only in the leases resulting from this proposed sale for Tracts A62-147 and A62-148.)

a. No structures, drilling rigs, or pipelines will be allowed within the 85 m isobath of Sackett Bank as defined in figure 6.

b. Operations within the area shown as "1 Mile Zone" in figure 6 shall be restricted by shunting all drill cuttings and drilling fluids to the bottom through a downpipe that terminates an appropriate distance, but no more than ten meters, from the bottom.

5. *Biological Resources Protection for Potential Live Bottom Areas in the Destin Dome Area.* (To be included only in the leases resulting from this proposed sale for Tracts A62-185 through A62-249.)

Prior to any drilling activity or placement of any fixed structure or pipeline or any other exploration or production activity, the lessee will submit to the Supervisor as part of his exploration and/or development plan a bathymetry map, prepared utilizing remote sensing and/or other survey techniques. Ths map will include interpretations for the presence of live bottom areas within a minimum 1,820 m (one nautical mile) radius of the proposed exploration or production activity site.

For the purpose of this stipulation, "Live Bottom Areas" are defined as those areas which contain biological assemblages consisting of such sessile invertebrates as sea fans, sea whips, hydroids, anemones, ascidians, sponges, bryozoans, or corals living upon and attached to naturally occurring hard or rocky formations with rough, broken, or smooth topography; or whose lithotope favors the accumulation of turtles and fishes.

If it is determined that remote sensing data indicate the possibility of live bottom areas, the lessee will submit to the Supervisor photo or other documentation of the sea bottom of the proposed exploratory drilling sites or proposed platform locations or points as determined by the Supervisor.

If it is determined that live bottom areas might be adversely impacted by the proposed activities, then the Supervisor will require the lessee to undertake any measures deemed economically, environmentally, and technologically feasible to protect live bottom areas. These measures may include, but are not limited to, the following:

1. the relocation of operations to avoid live bottom areas;
2. the shunting of all drilling fluids and cuttings in such a manner as to avoid live bottom areas;
3. the transportation of drilling fluids and cuttings to approved disposal sites; and,
4. the monitoring of live bottom areas to assess the adequacy of any mitigating measures taken and the impact of lessee-initiated activities.

6. *Biological Resources Protection for Applebaum Bank.* (To be included only in the lease resulting from this proposed sale for Tract 62-69.)

Operations within the area shown as "3 Mile Zone" in figure 7 shall be resricted as specified in either (a) or (b) below at the option of the lessee.

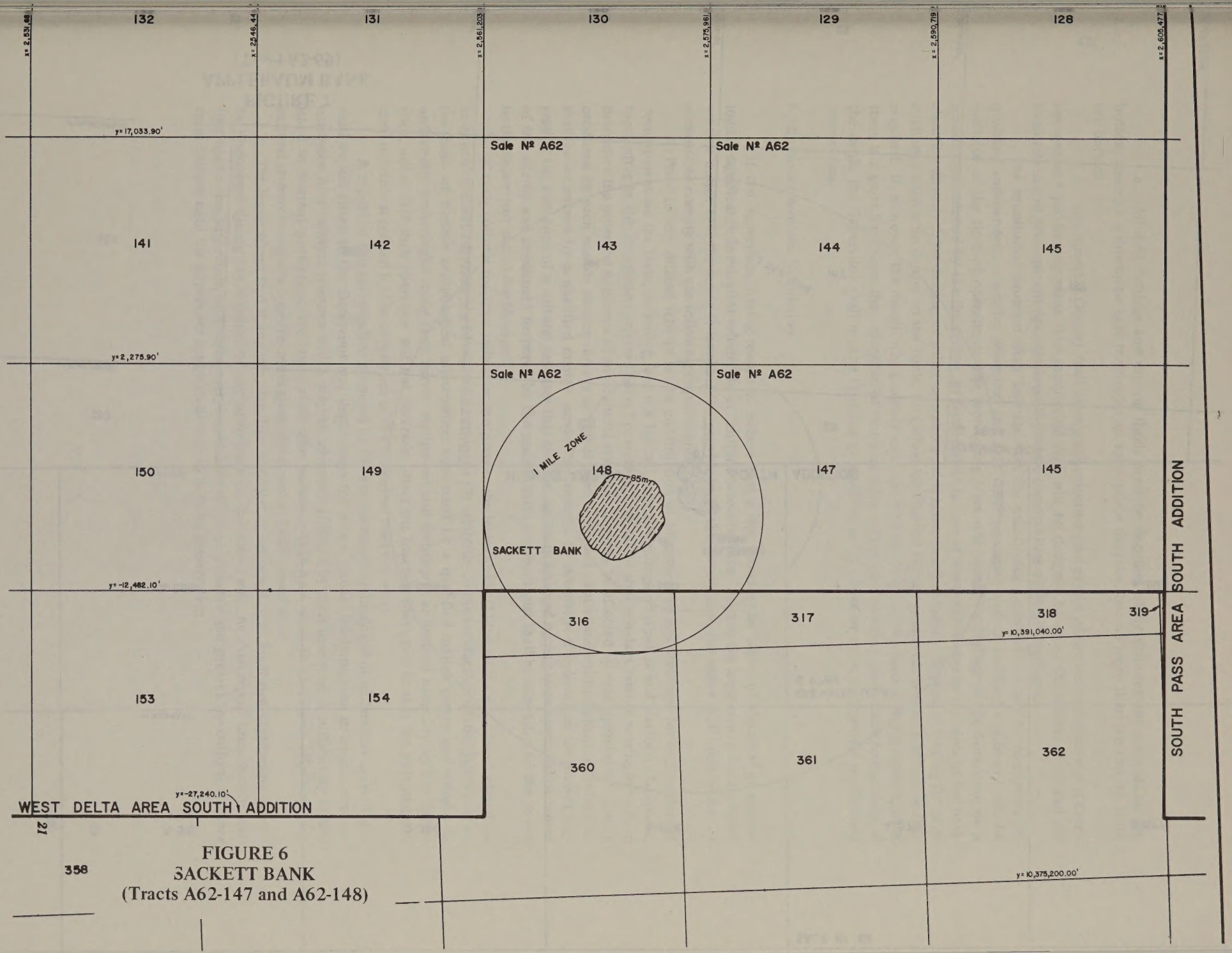


FIGURE 6
SACKETT BANK
(Tracts A62-147 and A62-148)

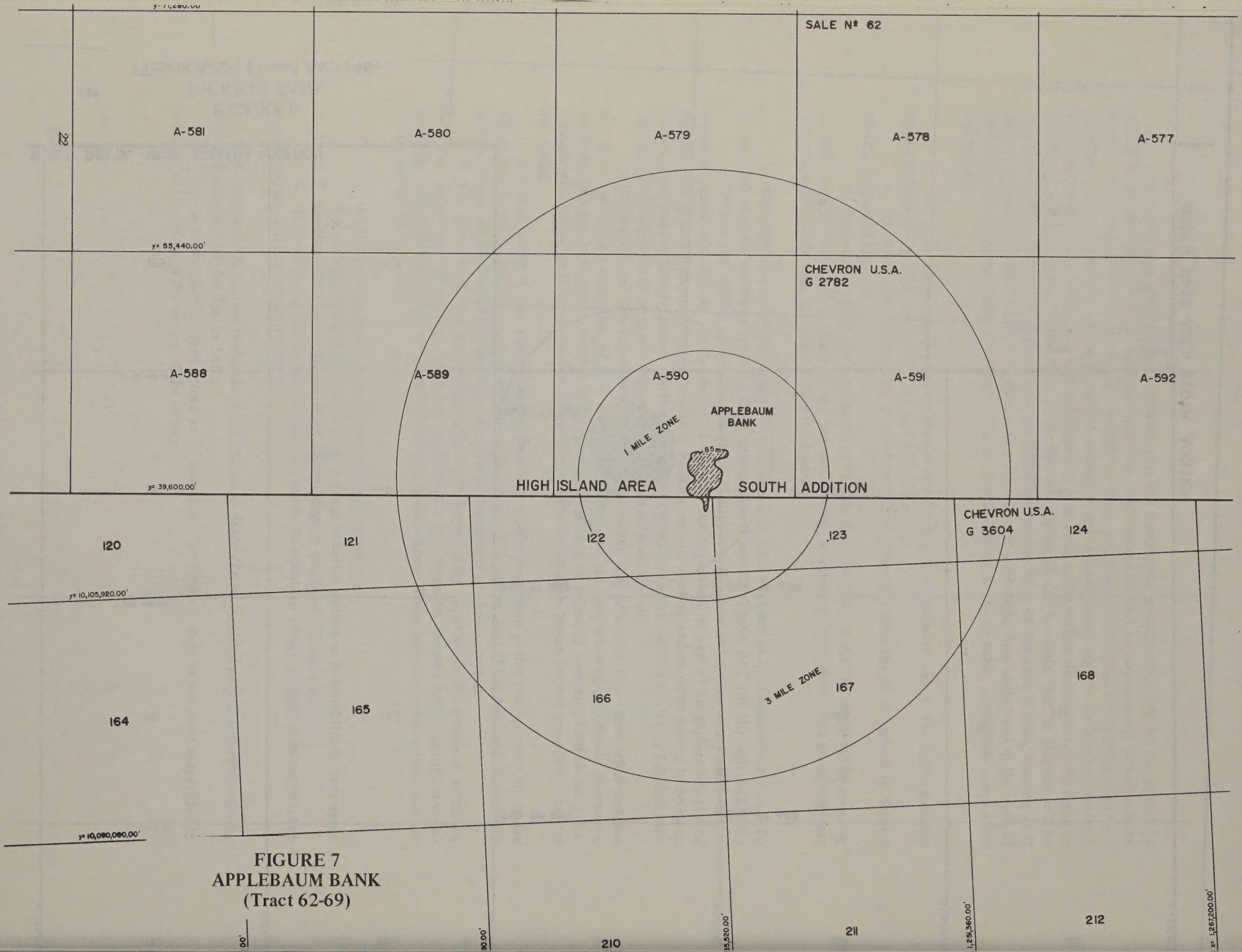


FIGURE 7
APPLEBAUM BANK
(Tract 62-69)

a. All drill cuttings and drilling fluids must be disposed of by shunting the material to the bottom through a downpipe that terminates an appropriate distance, but no more than ten meters, from the bottom.

b. The operator (lessee) shall submit a monitoring plan as part of the the exploration and development and production plans. The monitoring plan will be designed to assess the effects of oil and gas exploration and development operations on the biotic communities of the nearby banks.

The monitoring program shall indicate that the monitoring investigations will be conducted by qualified independent scientific personnel and that these personnel and all required equipment will be available at the time of operations. The monitoring team will submit its findings to the Supervisor on a schedule established by the Supervisor, or immediately in case of imminent danger to the biota of the bank resulting directly from drilling or other operations. If it is decided that surface disposal of drilling fluids or cuttings presents no danger to the bank, no further monitoring of that particular well or platform will be required. If, however, the monitoring program indicates that the biota of the bank is being harmed, or if there is a great likelihood that operation of that particular well or platform may cause harm to the biota of the bank, the Supervisor shall require shunting as specified in (a) above or other appropriate operational restrictions.

b. Cultural Resources Stipulation

If the Supervisor, having reason to believe that a site, structure or object of historical or archeological significance hereinafter referred to as "cultural resource", may exist in the lease area, gives the lessee written notice that the lessor is invoking the provisions of this stipulation, the lessee shall upon receipt of such notice comply with the following requirements.

Prior to any drilling activity or the construction or placement of any structure for exploration or development on the lease, including, but not limited to, well drilling and pipeline and platform placement, hereinafter in this stipulation referred to as "operation," the lessee shall conduct remote sensing surveys to determine the potential existence of any cultural resource that may be affected by such operations. All data produced by such remote sensing surveys as well as other pertinent natural and cultural environmental data shall be examined by a qualified marine survey archeologist to determine if indications are present suggesting the existence of a cultural resource that may be adversely affected by any lease operation. A report of this survey and assessment prepared by the marine survey archeologist shall be submitted by the lessee to the Supervisor and to the Manager.

If such cultural resource indicators are present the lessee shall: (1) locate the site of such operation so as not to affect adversely the identified location; or (2) establish, to the satisfaction of the Supervisor, on the basis of further archeological investigation conducted by a qualified marine survey archeologist or underwater archeologist using such survey equipment and techniques as deemed necessary by the Supervisor, either that such operation will not adversely affect the location identified or that the potential cultural resource suggested by the occurrence of the indicators does not exist.

A report of this investigation prepared by the marine survey archeologist or underwater archeologist shall be submitted to the Supervisor and the Manager for review. Should the Supervisor determine that the existence of a cultural resource which may be adversely affected by such operation is sufficiently established to warrant protection, the lessee shall take no action that may result in an adverse effect on such cultural resource until the Supervisor has given directions as to its preservation.

The lessee agrees that if any site, structure or object of historical or archeological significance should be discovered during the conduct of any operations on the leased area, he shall report immediately such findings to the Supervisor, and make every reasonable effort to preserve and protect the cultural resource from damage until the Supervisor has given directions as to its preservation.

Implementation of the Cultural Resource Stipulation:

A special study by Coastal Environments Inc. (CEI, 1977) has established probability zones for the potential existence of shipwrecks and aboriginal sites in the northern Gulf of Mexico. The cultural resource demarcation line depicted on visuals 1, 1E, 4 and 4E is derived from the high probability zones identified in CEI's study and is currently utilized as a primary factor in determining which tracts, if leased, will require site specific remote sensing surveys as called for in Stipulation 1.

Should the stipulation be adopted, instructions as to instrumentation, navigation, line spacing, and report format requirements are specified in a Notice to Lessees and Operators (NTL) (reference Appendix C, Draft EIS for Sale 58A). The Department of the Interior is presently considering a proposed revision to this notice. When the proposed revision has been drafted, it will be published in the Federal Register and comments solicited. Should a new notice be adopted, all surveys performed after the date of adoption would be subject to the revisions. The archeological report standards, based on the current NTL, are also being considered in the interim. See Appendix C for a draft copy of these proposed standards.

All areas identified from the remote sensing survey data as potentially containing significant historic or archeological resources would either be avoided, protected and/or identified and mitigated in accordance with prescribed regulations.

Based on the cultural resource demarcation line, BLM intends to recommend to the Supervisor, GS, that remote sensing surveys be required on the following tracts should they be leased in the proposed sales:

Sale A62: Tracts 11-30, 38-43, 46-50, 63-67, 71-95, 97-102, 105-112, 123-126, 131, 137-143, 148-161 and 167.

Sale 62: Tracts 5-9, 14-59, 62, 63, 65 and 70.

See Appendix D for a discussion of alternatives to the standard cultural resource lease stipulation.

c. Geologic Hazards Stipulation

Stipulations as a result of geologic conditions which may be hazardous to petroleum exploration, development and transportation will not be developed on a tract-by-tract basis until GS has completed their evaluation of geologic hazards. A summary of those areas which are considered to have high, medium and low hazard probability is presented in Section IV.A.7.

d. Military Area Stipulation

Sale A62

(To be included in any lease resulting from this proposed sale for tracts A62-185 through A62-221.)

Whether or not compensation for such damage or injury might be due under a theory of strict or absolute liability or otherwise, the lessee assumes all risks of damage or injury to persons or property, which occur in, on or above the Outer Continental Shelf, to any persons or to any property of any person or persons who are agents, employees or invitees of the lessee, its agents, independent contractors, or subcontractors doing business with the lessee in connection with any activities being performed by the lessee in, on, or above the Outer Continental Shelf, if such injury or damage to such person or property occurs by reason of the activities of any agency of the U.S. Government, its contractors or subcontractors, or any of their officers, agents or employees, being conducted as a part of, or in connection with the programs and activities of the Armament Development and Test Center, Eglin Air Force Base, Florida.

Notwithstanding any limitation of the lessees's liability in Sec. 14 of the lease form, the lessee assumes this risk whether such injury or damage is caused in whole or in part by any act or omission,

regardless of negligence or fault, of the United States, its contractors or subcontractors, or any of their officers, agents, or employees. The lessee further agrees to indemnify and save harmless the United States against and to defend at its own expense the United States against all claims for loss, damage, or injury sustained by the lessee, and to indemnify and save harmless the United States against, and to defend at its own expense the United States against all claims for loss, damage, or injury sustained by the agents, employees, or invitees of the lessee, or any independent contractors or subcontractors doing business with the lessee in connection with the programs and activities of the aforementioned military installation, whether the same be caused in whole or in part by the negligence or fault of the United States, its contractors, subcontractors, or any of their officers, agents, or employees and whether such claims might be sustained under a theory of strict or absolute liability or otherwise.

The lessee agrees to control his own electromagnetic emissions and those of his agents, employees, invitees, independent contractors or subcontractors emanating from individual designated defense warning areas in accordance with requirements specified by the commander of the Armament Development and Test Center, Eglin Air Force Base, Florida, to the degree necessary to prevent damage to, or unacceptable interference with, Department of Defense flight, testing or operational activities, conducted within individual designated warning areas. Necessary monitoring control, and coordination with the lessee, his agents, employees, invitees, independent contractors or subcontractors, will be affected by the commander of the appropriate onshore military installation conducting operations in the particular warning area provided; however, that control of such electromagnetic emissions shall in no instance prohibit all manner of electromagnetic communication during any period of time between a lessee, its agents, employees, invitees, independent contractors or subcontractors and onshore facilities.

The lessee, when operating or causing to be operated on its behalf boat or aircraft traffic into the individual designated warning areas, shall enter into an agreement with the commander of the Armament Development and Test Center, Eglin Air Force Base, Florida, utilizing an individual designated warning area prior to commencing such traffic. Such agreement will provide for positive control of boats and aircraft operating in the warning areas at all times.

When the activities of the Armament Development and Test Center, Eglin Air Force Base, Florida, may endanger personnel or property, the lessee agrees, upon receipt of a directive from the Secretary, to evacuate all personnel from all structures on the lease and to shut-in and secure all wells and other equipment, including pipelines on the lease, within forty-eight (48) hours or within such longer period as may be specified by the directive. Such directive shall not require evacuation of personnel and not require evacuation of personnel and shutting-in and securing of equipment for a period of time greater than seventy-two (72) hours; however, such period of time may be extended by subsequent directive from the Secretary. Equipment and structures may remain in place on the lease during such time as the directive remains in effect.

Sale 62

(To be included in any lease resulting from this proposed sale for tracts 62-1, 62-2, 62-3, 62-4, 62-5, 62-6, 62-9, 62-10, 62-11, 62-12, 62-13, 62-19, 62-20, 62-21, 62-22, 62-23, 62-24, 62-72, 62-73, 62-74.)

Whether or not compensation for such damage or injury might be due under a theory of strict or absolute liability or otherwise, the lessee assumes all risks of damage or injury to persons or property, which occur in, on, or above the Outer Continental Shelf, to any persons or to any property of any person or persons who are agents, employees or invitees of the lessee, its agents, independent contractors, or subcontractors doing business with the lessee in connection with any activities being performed by the lessee in, on, or above the Outer Continental Shelf, if such injury or damage to such person or property occurs by reason of the activities of any agency of the U.S. Government, its contractors or subcontractors, or any of their officers, agents or employees, being conducted as a part of, or in connection with the programs and activities of the Naval Air Training Command, Naval Air Station, Corpus Christi, Texas.

Notwithstanding any limitation of the lessees's liability in Sec. 14 of the lease form, the lessee assumes this risk whether such injury or damage is caused in whole or in part by any act or omission, regardless of negligence or fault, of the United States, its contractors or subcontractors, or any of their officers, agents, or employees. The lessee further agrees to indemnify and save harmless the United States against and to defend at its own expense the United States against all claims for loss, damage, or injury sustained by the lessee, and to indemnify and save harmless the United States against, and to defend at its own expense the United States against all claims for loss, damage, or injury sustained by the agents, employees, or invitees of the lessee, its agents, or any independent contractors or subcontractors doing business with the lessee in connection with the programs and activities of the aforementioned military installation, whether the same be caused in whole or in part by the negligence or fault of the United States, its contractors, subcontractors, or any of their officers, agents, or employees and whether such claims might be sustained under a theory of strict or absolute liability or otherwise.

The lessee agrees to control his own electromagnetic emissions and those of his agents, employees, invitees, independent contractors or subcontractors emanating from individual designated defense warning areas in accordance with requirements specified by the commander of the Naval Air Training Command, Naval Air Station, Corpus Christi, Texas, to the degree necessary to prevent damage to, or unacceptable interference with, Department of Defense flight, testing or operational activities, conducted within individual designated warning areas. Necessary monitoring control, and coordination with the lessee, his agents, employees, invitees, independent contractors or subcontractors, will be effected by the commander of the appropriate onshore military installation conducting operations in the particular warning area, provided, however, that control of such electromagnetic emissions shall in no instance prohibit all manner of electromagnetic communication during any period of time between a lessee, its agents, employees, invitees, independent contractors or subcontractors and onshore facilities.

The lessee, when operating or causing to be operated on its behalf boat or aircraft traffic into the individual designated warning areas shall enter into an agreement with the commander of the Naval Air Training Command, Naval Air Station, Corpus Christi, Texas, utilizing an individual designated warning area prior to commencing such traffic. Such agreement will provide for positive control of boats and aircraft operating in the warning areas at all times.

5. Other Mitigating Actions

a. Contingency Plans

To implement the Federal Water Pollution Control Act (FWPCA), the President's Council on Environmental Quality developed the National Oil and Hazardous Substances Pollution Contingency Plan following specific legislative directions to include:

(1) the duties and responsibilities of each Federal agency in coordination with state and local agencies;

(2) a strike force of trained personnel available to provide the earliest possible notice of a discharge;

(3) a system of surveillance to provide the earliest possible notice of a discharge;

(4) a national center to coordinate the plan; and,

(5) procedures and techniques for identifying, containing and removing the discharge (or dispersing it if circumstances deem it necessary).

The FWPCA establishes the Environmental Protection Agency and the Coast Guard as enforcing agencies. These agencies have the authority and the capacity to marshall the nation's capability to combat an oil spill.

b. Oil Spill Fund

Title III of the Outer Continental Shelf Lands Act Amendments established the Offshore Oil Pollution Fund including procedures to be followed in the event of an oil spill. The fund is not to exceed $200 million and is responsible for rapid response teams along the coast. For a more detailed discussion of the contingency plans and the fund established for cleanups refer to Section IV.A.4.d., p. 180, DEIS Sale 58A.

c. Fishermen's Contingency Fund

Title IV of OCSLA Amendments of 1978 provides for a fund in the U.S. Treasury, not to exceed $1 million, for the purpose of compensating commercial fishermen for losses due to activities related to OCS oil and gas operations, when no financially responsible party can be identified.

The Secretary of Commerce is authorized to establish and maintain accounts within the fund for all areas of the OCS by assessing holder's of OCS leases, exploration permits, easements, or pipeline rights-of-way; the Secretary of Interior is charged with collecting the money. Each area account is to be maintained at a level not to exceed$100,000.

The Secretary of Commerce is charged with developing and amending regulations for the filing, processing and expeditious settlement of claims; the National Marine Fisheries Service is currently in the process of developing the regulations. Proposed rules were published in the Federal Register, Vol. 44, No. 102, pp. 30292-30304, on May 24, 1979. Further, the Secretary of Commerce, in cooperation with the Secretary of the Interior, must conduct a two-year survey of obstructions on the OCS which pose potential hazards to commercial fishing or fishing gear. Both natural and man-made hazards are to be surveyed, and charts identifying these hazards will be developed for commercial fishermen. The first six months of this survey shall concentrate in OCS areas where OCS oil and gas production has commenced or will commence within the two year survey period.

d. Oil Spill Prevention and Mitigation

The prevention and mitigation of major oil spills has historically been a prime consideration in OCS resource management. The massive Mexican OCS oil spill which threatens to encroach on U.S. territorial waters has even more sharply focused attention on the need to develop additional measures to prevent or mitigate potentially harmful impacts. In this regard the New Orleans OCS Office is stepping up its efforts to prevent pipeline breaks caused by anchor dragging, and to develop an oil spill analysis model for the Gulf of Mexico.

Pipeline and Platform Mapping

There are already thousands of miles of pipelines within the OCS oil and gas producing areas which connect to terminal and processing facilities onshore. The proposed lease sale will add as much as 450 miles of additional pipeline. All of this pipeline is subject to accidental damage and potential breaks (and resulting oil spills) caused by anchor dragging. Both pipeline and shipping experts agree that the major constraint on avoiding these accidents is the lack of accurate and detailed information on the location of these pipelines. The New Orleans OCS Office is in agreement with the importance of such information and has prepared maps at a scale of 1"=4,000' detailing all major pipelines in the Gulf of Mexico (U.S.) which are used in the pipeline permitting process. The GS, BLM and National Ocean Survey are also cooperating in a new mapping series showing pipelines and platforms at a scale of 1:250,000 UTM. Construction of base maps for pipelines and platforms in the eastern and western Gulf of Mexico, commonly used by navigators of tankers, tugs and supply boats, is being coordinated between DOI and NOAA.

The major uncertainties in protection against massive oil spills are due mainly to "Acts of God," such as hurricanes or major storms and damage by unexpected severe geopressures which cannot be safeguarded against by engineering procedures. Human error has fortunately been a minimal cause for oil spills to date in the Gulf of Mexico.

An oil spill risk analysis model for the Gulf of Mexico is needed to help mitigate the effects of these occurrences. At the present time, oceanographic data is being compiled by the government as the data base for a 1980-1981 study, "Gulf of Mexico Circulation Model." With this model, site specific predictions based on currents, winds and spill location, can be made when an oil spill occurs, to forecast where probable impacts will occur. Mitigating measures can be planned and instituted before actual occurrence in order to alleviate any subsequent environmental consequences. This type of model would be useful in developing the regional impact statement which is planned for the future.

In conclusion, accurate pipeline maps coupled with up-to-date notice to mariner data, and careful navigation and anchoring procedures, will decrease the chance for oil spills due to pipeline breaks. Improved oil spill models in the Gulf of Mexico will aid in mitigative planning and deployment of oil spill cleanup equipment. As special studies and development techniques continue to be tested, avoidance or mitigation of oil spills by tracking and cleanup are at a high level of effective mitigation in the Gulf of Mexico.

II

Section II

Alternatives Including The Proposed Action

II. ALTERNATIVES INCLUDING THE PROPOSED ACTION

There are three major alternatives to holding the proposed oil and gas lease sale. They are: Delay the Sale, Cancel the Sale (i.e., no action) and Modify the Sale (in 6 different ways). Each of these options will be compared to the alternative of holding the sale as proposed. Various energy replacements for the sale will be examined under the option of canceling the sale.

A. Alternative "A" -- Hold the Sale as Proposed

1. Description

The area under consideration for this proposed Gulf of Mexico sale has already been described in Section I.E.1.

Holding the sale as proposed will result in the expected addition of 27.1 million barrels of oil and 735 billion cubic feet of gas or 14,000 barrels and 300 million cubic feet of gas per day (mean estimate); however, using a net energy yield ratio of 6.0 to 1 (barrels of oil recovered to barrels expended on drilling, production and refining in the Gulf Region, Odum, 1976), this means that the net energy delivered will be 22.6 million barrels of oil and 613 billion cubic feet of gas (mean estimate) or 11,667 barrels and 250 million cubic feet of gas per day. This is judged to be the gain to the nation from both the standpoint of American physical energy needs and the economic and political goal of independence from energy imports.

Section I.E.1. describes in detail what the expected resource development of the proposed sale will be.

2. Summary of Environmental Consequences

a. Impact on Multiple Use Area

A potential user conflict exists between DOD and DOI over 37 Destin Dome Area tracts (A62-185 through A62-221) which are located on the crest and western flank of the Destin Dome Anticline. This area is used by the DOD for their military operations; simultaneously, the anticline has high potential for oil and gas development.

A special study is being undertaken by the DOD concerning their own present uses and its affects on future leasing activities which may occur as a result of this sale.

Conclusion

Upon completion of this study, a determination will be made whether or not to retain these 37 tracts.

b. Impact on Employment

A detailed analysis of the impacts to employment which will result from this sale is given in section IV.B.1.b.

In summary, a considerable amount of employment (job opportunities) will be generated, particularly at the local level, and reduce the potential level of unemployment. Demand for housing induced by the sale will result in very small increases in the demand for educational and other public services. It is anticipated that providing these services will be accomplished without significantly lowering existing service levels or standards. At worse, the proposed lease sale could result in, or contribute to, a minor short-term impact on the quality of a public service (e.g., education) in a particular area.

Conclusion

No significant short- or long-term adverse impacts are expected as a direct result of the proposed lease sales.

c. Impact on Air Quality

As a result of Alternative "A" emissions from offshore oil/gas activities may slightly degrade air quality in the vicinity of offshore production sites. In most cases, these emissions will be local and be dissipated by wind (Section IV.B.1.c.).

If a natural gas leak or blowout were to occur, degradation would occur locally. It is expected that the methane pollutants would quickly volatilize and drift away. In the case of a fire, pollutants would be largely carbon dioxide and water vapor. Oil spills not accompanied by a fire would introduce highly volatile, low molecular weight hydrocarbons such as benzene and toluene into the atmosphere. These lighter fractions of crude oil would undergo some unknown degree of degradation, possibly resulting in photochemical smog. If a spill were to result in a fire, large amounts of particulate carbon and oxides, evaporated crude oil liquids, and partially oxidized compounds would enter the air. Local air quality would be severely degraded during the duration of the fire. The extent of degradation cannot be determined but it is unlikely that it would be high enough to effect land resources or human health. Should a fire occur, the resultant impact would be considered adverse and unavoidable.

Onshore air quality may be slightly degraded in the vicinities of terminal/storage facilities in Corpus Christi, Texas; Caillou Lake, Louisiana; and Navarre, Florida areas if these facilities are constructed as a result of this proposal. Federal State and local air quality regulations would mitigate air pollution emissions from these onshore facilities.

Conclusion

Offshore and onshore air quality will not be severely degraded as a result of Alternative A. Also, cumulative air quality degradation is not expected as a result of this proposal because it will probably replace existing production.

d. Impact on Water Quality

Water quality in the Gulf will be temporarily degraded by resuspension of sediment during pipeline burial. The jetting away of the substrate from beneath the pipeline will result in suspension of sediments which may contain pollutants such as heavy metals and pesticides. The area affected will be in the direction of the current movement. Various other phases of offshore operations (emplacement of re-entry collars, blowout preventers, drilling platforms, etc.) will also cause suspension of bottom sediments in a localized area. The magnitude of deterioration depends on numerous variables, among them bottom type, currents, and duration of the activity (IV.B.1.d).

During drilling operations, discharged drilling mud and cuttings will adversely affect water quality. The severity of this impact depends upon such factors as the volume and type of drilling mud and cuttings discharged. The turbidity plume that would result from the discharge of drilling mud and cuttings would be localized. A turbidity plume from a rig can extend over a mile in length; however, analyses have indicated that most components fall out within 1,000 meters of the well site.

The production and discharge of formation waters (oil field brines) may contribute to water quality degradation when released into the Gulf. Produced formation waters may contain toxic substances, heavy metals, dissolved hydrocarbons and inorganic salts. The heavy metals may include cadmium, chromium, copper, lead, mercury, nickel and zinc, although these are generally present in trace quantities. The consti-

tuents of these brines vary from formation to formation and within a single formation; but due to the fact that these brines are essentially relict sea water, oceanic water quality will not be significantly adversely affected by them.

In the case of an oil spill the diluting effect of the large volumes of Gulf waters and the microbial degradation of the hydrocarbons will act to reduce the deleterious effects over time. The seriousness of the effects on water quality will depend upon the volume of oil spilled and depth of water, in shallow water the oil may become entrapped in the sediments and later become resuspended in the water column during a storm.

Conclusion

Water quality will be locally and temporarily (weeks to months) degraded as a result of certain activities associated with oil and gas development as a result of this proposal.

e. Impact on Fisheries Resources

The impacts of OCS oil and gas activities on fisheries resources in the northern Gulf of Mexico are not well known; however, it is believed the proposed sale would have little apparent affect on the fisheries resources since the commercial fishing industry in the Gulf continues to be viable after 30 years of continuous and expanding oil/gas operations. Some localized, short-term fisheries habitat alterations and displacement or smothering of organisms will occur in a limited amount. Conversely, the creation of additional habitat, (i.e., platforms and other structure) that act as artificial reefs, will add some new fishing opportunities (IV.B.1.e.).

Gear conflicts between trawlers and debris on the OCS could increase slightly as a result of the placement of additional platforms and pipelines but the adverse impacts should be ameliorated with the implementation of Title IV of the OCSLAA of 1978, which establishes a fund to pay for losses incurred as a result of OCS activity.

Conclusion

The impacts on fisheries resources will probably be minimal as a result of this proposed sale.

f. Impact on Endangered Species

The Fish and Wildlife Service and National Marine Fisheries Service's biological opinions (Appendix E) indicate no jeopardy to the continued existence of endangered/threatened species or their habitats as a result of this proposal.

However, there is a potential risk of a moderate localized impact to discrete populations of brown pelicans near Grand Terre and Chandeleur Islands in southeastern Louisiana and marine turtles in northwestern Florida (see section IV.B.1.f.).

Conclusion

There is no historical evidence of a measurable impact to endangered/threatened species from OCS oil/gas activities in the Gulf of Mexico region. However, there is a potential risk of localized impact to brown pelicans in southeastern Louisiana and marine turtles in northwestern Florida from oil spills and or facility construction as a result of this proposal.

g. Impact on Shoreline Recreational Resources

The proposed action is likely to cause minor, intermittent pollution and debris wash-up on shoreline recreational resources throughout the Gulf of Mexico affecting the aesthetic quality of some shoreline beaches which will contribute to the routine maintenance problems of shorefront beach and park administrators.

Conclusion

This predictable impact to shoreline resources will be a nuisance to some beach users but is unlikely to affect the level of use either regionally or locally. Additionally, pipeline landfalls in Texas and Florida, should they occur, could preclude the recreational use of approximately 400 feet of Gulf front beach for a few weeks.

h. Impact on Recreational Fishing

This proposal should enhance recreational fishing offshore in the Gulf of Mexico within leased tracts which are developed, especially those within 20 miles of shore. Continued and increasing oil and gas leasing activity in the Gulf of Mexico has led to the development of approximately 2,500 existing offshore structures which function as artificial fishing reefs.

Conclusion

Taken as a group these structures have had a profound influence on the recreational fishing patterns of offshore marine anglers from Texas to Mississippi.

B. Alternative "B" – Modify the Proposal Via Tract Deletions

Alternative A's tract list is subject to modification at the request of local, state and Federal government agencies, companies, individuals and organizations for a variety of reasons. Six modifications comprise Alternative B and deal with:

1) Legal Controversy
2) Multiple Use Area Conflict
3) Biological Protection
4) Geologic and Engineering Hazards
5) Continental Slope
6) Special Coordination Area (Buffer Zone)

For a comparison of impacts for each modification to Alternative A, see table 3 in section II.E. which lists impacts relative to the specific area of concern. Deletion of each modification, likewise, reduces the potential of oil/gas production by the percentage indicated.

1. Modification B-1: Delete 5 Tracts Involved in Legal Controversy

a. Description

These 5 tracts (A62-71 through A62-75) are located about 15 nmi offshore south of Marsh Island, Louisiana. The tracts are considered oil and gas prone, and are estimated to contain about 5 percent of the oil reserves and 2 percent of the gas reserves of the proposed action (Alternative A).

A number of years ago the area in which these tracts are located was leased by an oil company. Since that time this lease has been the subject of several lawsuits, and legal action is presently pending. These tracts are included in the proposed action (Alternative A) based on the assumption that the legal dispute will be resolved by the date of the proposed lease sale. This alternative provides for the contingency that the legal dispute may not be resolved by the date of the proposed lease sale.

b. Summary of Environmental Consequences

Modification B-1 will result in the environmental effects discussed for Alternative A except as follows:

(1) A slight decrease in employment and related benefits.
(2) A slight reduction in the possible occurrence of somewhat negative localized and short-term effects on community infrastructure resources.
(3) Preclusion of environmental effects on air and water quality from the deleted tracts.
(4) A very slight reduction in recreational fishing opportunities.
(5) The preclusion of any environmental effects which would have resulted from oil and gas development activities in those tracts.

Conclusion

Modification B-1 will:

— provide for the contingency that the legal dispute now affecting the tracts included in the modification will not be settled by the time of the lease sale.

— result in an action with environmental consequences which are not expected to be significantly different from those of Alternative A.

— result in an action with smaller estimated oil and gas reserves (a 5 percent reduction in the oil reserves and a 2 percent reduction in the gas reserves estimated for Alternative A is assumed). Thus, the modification could preclude the domestic production of about 0.8-2.5 million barrels of oil and 0.01-0.05 trillion cubic feet of gas estimated for Alternative A. The loss of this production represents a lost opportunity to lessen our dependence on foreign oil importation.

2. Modification B-2: Delete 37 Tracts in Destin Dome Multiple Use Area Which Also Have Potential Live Bottoms

a. Description

Destin Dome Area

The Destin Dome Area in the Gulf of Mexico, due to locational and natural characteristics, is an area of many present and potential uses. A conflict exists between the Department of Defense (DOD) and Department of the Interior (DOI) over its respective uses. DOD has listed most of it as a military warning area and uses it as a missile range site, as well as conducting other military operations there. Within the area there exists the Destin Dome anticline, a site which is believed to have potential for oil and gas resources. It is this area about which no agreement has been reached between DOI and DOD to consider tracts for proposed lease sales.

These 37 tracts (A62-185 through A62-221) are located on the crest and western flank of the Destin Dome anticline about 28 to 45 nmi south of Destin, Florida in water depths ranging from 60 to 140 meters (see visual 1 and Tract Overlay). The tracts are estimated to be oil prone and contain about 39 percent (6 to 19 million barrels) of the oil reserves of this proposed sale.

In the original tentative tract list developed for Sale 62, no tracts in the Destin Dome Area were included. At the request of the BLM, Washington Office, a revised tentative tract list was resubmitted to include 37 tracts in the Destin Dome Area. Subsequently, a request for "Comments and Indication of Interest" was published in the March 13, 1979 Federal Register. Interest by industry was extremely low; nevertheless, in consideration of national interests and the energy shortage, they were retained in the final tract list for the proposed sale.

Because of this potential user conflict, a special study is being undertaken by the DOD concerning their own present uses and the affects on future leasing activities which may occur as a result of this proposed sale. Based upon the findings of this study a determination will be made whether or not to retain these tracts in the proposed lease sale.

Potential Live Bottoms

Based on findings of the "Eastern Gulf Marine Habitat Study," there is a potential of emergent hard bottom areas within these tracts which could support sensitive biological communities. Such features were identified in certain tracts offered in Sale 65 which were located in the general vicinity of these tracts. A similar study is planned for these Destin Dome tracts (FY 80 Regional Study Plan) if they are retained.

In addition, studies were conducted relative to the physical, biological and chemical oceanographic parameters by the Florida State University System Institute of Oceanography (SUSIO). Details of their study findings were published in the Mississippi-Alabama-Florida (MAFLA) studies, contracts 08550-CT5-30 and AA550-CT7-13.

A stipulation should be applied to any lease issued for these tracts requiring, in general, that if any remote sensing surveys detect the possibility of live bottom areas, the lessee verify by photographic television, or sampling means, that no live bottom areas exist within 1 nmi of any proposed activity or, that if drilling must take place within 1 nmi of such an area, then certain protective measures must be instituted, including, but not limited to, shunting and monitoring. In addition, the lessee would be required to prepare and submit a bathymetry map prior to any drilling operations. It is believed that this stipulation is necessary to provide adequate protection to the sensitive biological communities which may exist on these tracts (see section I.E.4.a.).

b. Summary of Environmental Consequences

Modification B-2 (DOD tracts) will result in all the environmental effects discussed for Alternative A except as follows:

1) A moderate reduction in employment and related potential benefits.
2) No increased pressure on community infrastructure.
3) A moderate reduction in air and water pollution.
4) Removal of a potential risk to endangered marine turtles and their habitats.
5) A moderate reduction of a potential risk to shoreline recreational resources.
6) A minor loss of recreational fishing enhancement.

Conclusion

Modification B-2 will:

— provide for the possibility that an agreement between DOI and DOD on the use of the area for oil and gas development purposes will not be reached prior to the lease sale.

— result in an action which eliminates the risk of adverse effects on marine turtles and shoreline recreation resources from oil and gas development in the modification tracts, but with other environmental effects which are not expected to be significantly different from those of Alternative A.

— result in an action with substantially less potential oil reserves (a reduction of up to 39 percent in the oil reserves estimated for Alternative A could result). Thus, the modification could preclude the domestic production of about 6-19 million barrels of oil estimated for Alternative A. The loss of this modification represents a lost opportunity to lessen our dependence on foreign oil importation.

3. Modification B-3: Delete 10 Tracts in Areas Requiring Biological Protection

a. Description

These 10 tracts (A62-53 through A62-57, A62-62, A62-104, A62-135, A62-136 and A62-69) are located off the Texas and Louisiana coasts at 5 separate locations which are on or near biologically sensitive areas (topographic highs) rising out of deep water near the continental shelf break (see visual and Tract Overlay).

Oil and gas exploration and development activities have the potential to adversely affect certain productive and unique biological communities found in "biologically sensitive areas." Alternative A includes these 10 tracts with stipulations considered appropriate and effective in either avoiding or mitigating the potential effects of oil and gas development activities. The probability of significant adverse impacts occurring under Alternative A is considered minimal. The purpose of this modification is to completely remove the risk of any environmental impacts to these biologically sensitive areas which could result from oil and gas development activities in the subject tracts.

Eight of the tracts are considered gas prone and 2 are considered both oil and gas prone. The tracts are estimated to contain about 4 percent of the total gas reserves and about 2 percent of the total oil reserves estimated for Alternative A.

b. Summary of Environmental Consequences

Modification B-3 will result in the environmental effects discussed for Alternative A except as follows:

(1) A slight decrease in employment and related potential benefits.

(2) A slight reduction in the possible occurrence of somewhat negative, localized and short-term effects on community infrastructure resources.

(3) Preclusion of environmental effects on air and water quality from the deleted tracts.

(4) A slight reduction in fishing opportunities.

(5) Preclusion of any environmental effects which could result from oil and gas development activities in the deleted tracts.

Conclusions

Modification B-3 will:

— preclude any environmental effects on biologically sensitive areas which could result from oil and gas development activities in the deleted tracts.

— result in an action with environmental consequences which are not expected to be significantly different from those of Alternative A.

— result in an action with smaller estimated oil and gas reserves (a 4 percent reduction in the gas reserves and a 2 percent reduction in the oil reserves estimated for Alternative A is assumed). Thus, the modification could preclude the domestic production of about 0.3-1.0 million barrels of oil and 0.02-0.04 trillion cubic feet of gas estimated for Alternative A. The loss of this production represents a lost opportunity to lessen our dependence on foreign oil importation.

4. Modification B-4: Delete 6 Tracts Due to Geologic and Engineering Hazards

a. Description

Portions of the Mississippi deltaic deposition offshore are known to be areas having great potential for geologic and engineering hazards. The following six tracts proposed for this sale are located in that area:

Mississippi Canyon
Tract A62-167
Main Pass
Tract A62-141
South Pass
Tract A62-137
Tract A62-138
Tract A62-139
Tract A62-140

Two dynamic geologic conditions prevail in the Gulf of Mexico which may critically impact petroleum exploration and development:

a) salt movement resulting in domes, faults, steep slopes, gas seepage and sediment slumping; and,
b) rapid sedimentation in deltaic areas that result in underconsolidated, fine grained, often gas-charged sediments which can flow and slump on very low slope gradients.

These conditions are known to occur frequently around the Mississippi Delta, the area in which the 6 tracts are located (see figure 8). It has the highest potential for adverse geologic conditions that could affect oil and gas exploration activities that could result in accidents, and possibly deaths. Figure 9 indicates the millions of tons per year of sediment discharge from the Mississippi River. As depicted in figure 10, sediment discharge from the Mississippi River is predominantly fine sand and clay, and estimated to be 303 million tons per year.

Special studies (The Mississippi Slope Stability Studies) are currently being undertaken by USGS and BLM to map the entire area of the Mississippi delta offshore area, giving special attention to unstable bottom sediments. These detailed maps are tentatively scheduled for completion in late 1979 and will probably result in special stipulations being issued for specific deltaic tracts. Figure 8 indicates one of the areas being studied.

The estimated potential resources for this modification is 2 percent gas and 5 percent oil of the total resources of Alternative A.

b. Summary of Environmental Consequences

All of the effects listed under Alternative A will occur except as follows:

(1) A slight decrease in employment and related potential benefits.
(2) A very slight reduction in recreational fishing opportunities.
(3) The modification would also preclude any environmental effects to the deleted tracts (or other affected areas) which could result from well drilling, rig and platform installation, pipeline laying and production activitiy.

Conclusion

Modification B-4 will:

— preclude the possibility of personal injuries and deaths that could result from accidents caused, or contributed to, by the adverse geologic conditions and engineering hazards associated with the modification tracts.

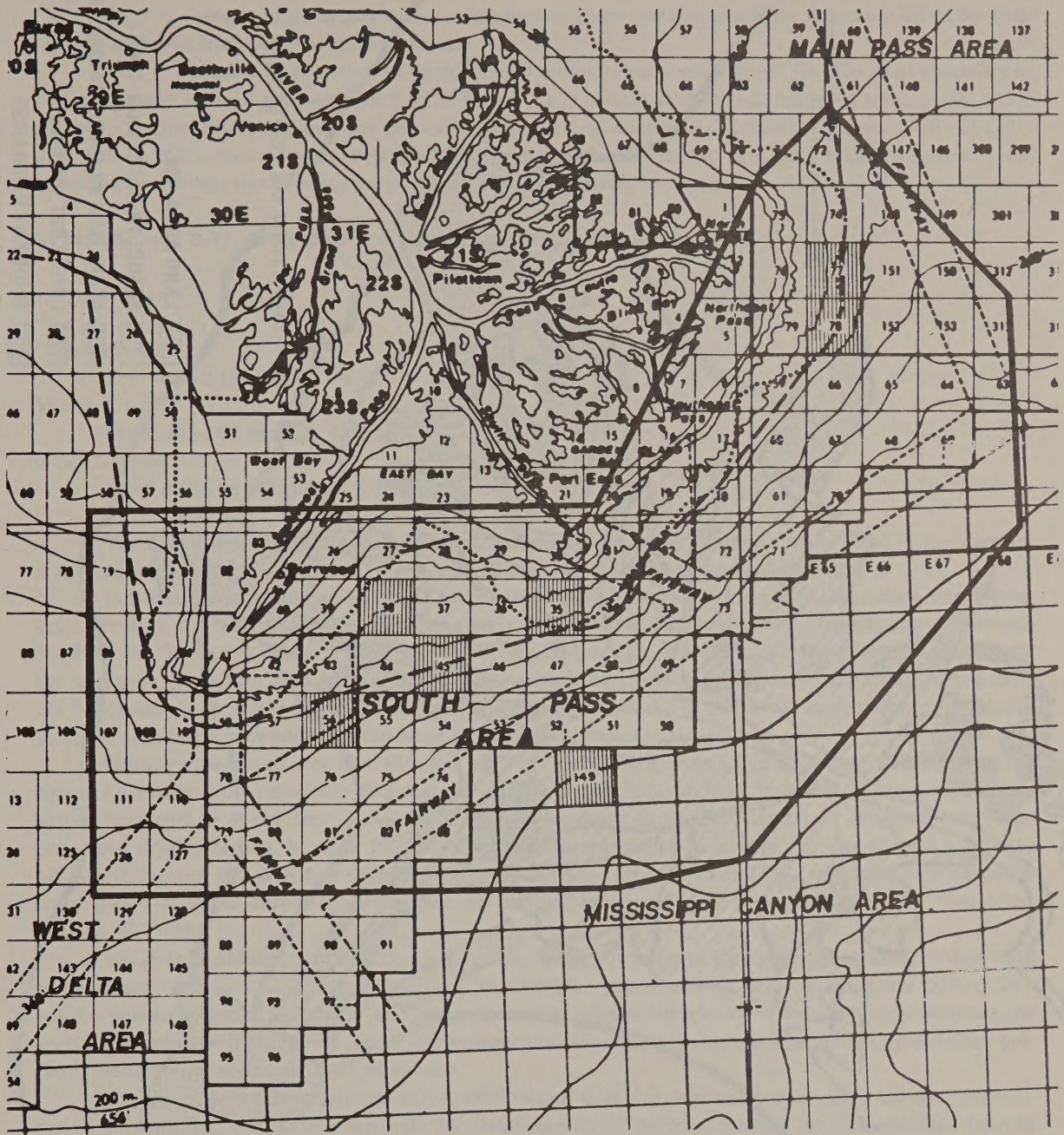


FIGURE 8. MISSISSIPPI DELTA AREA

Mississipp Delta Slope Stability Map Area

Tracts Listed in Modification B-4

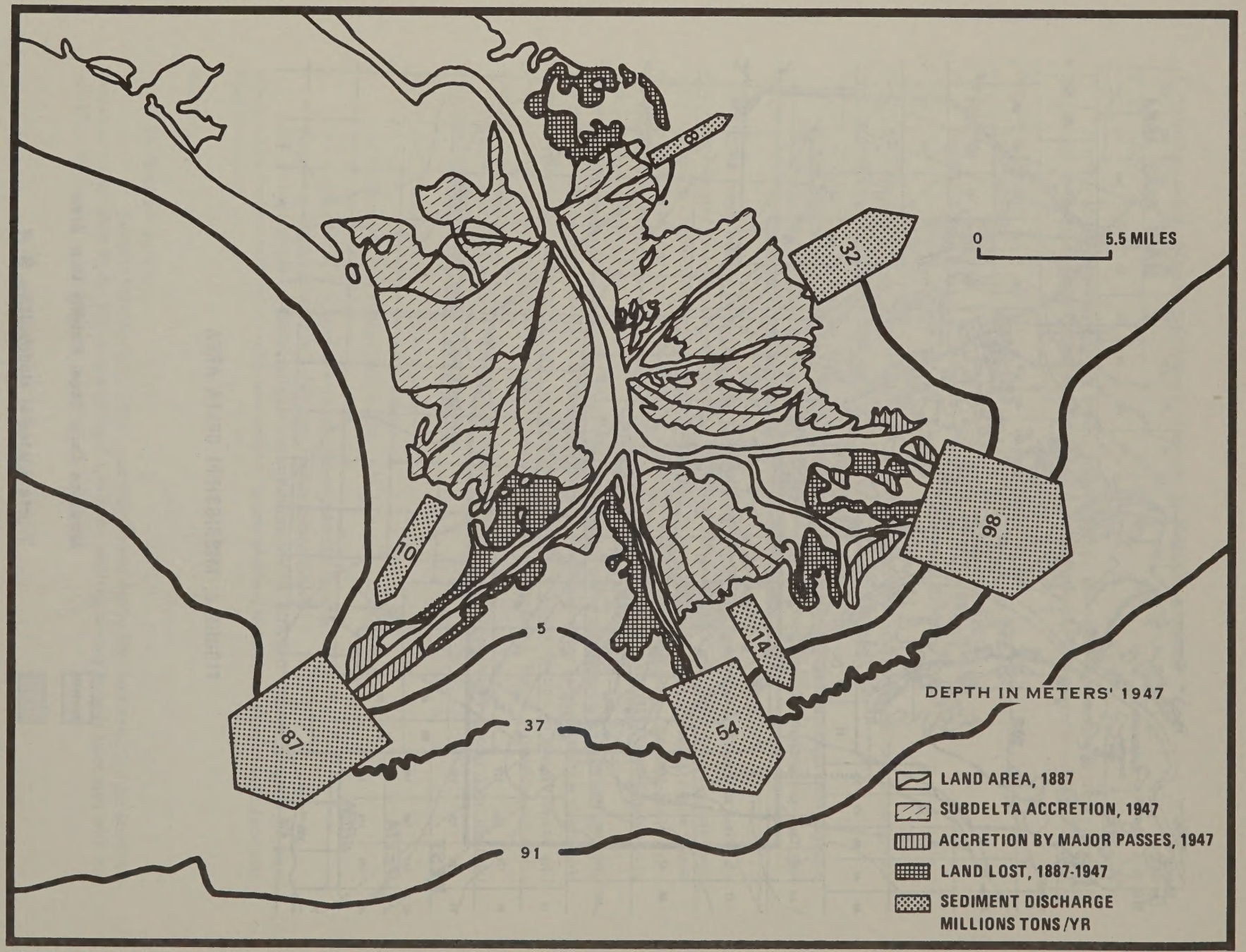


FIGURE 9
MISSISSIPPI DELTA SEDIMENT DISCHARGE

SOURCE: GALIANO ET AL. (1971)

— result in an action with environmental consequences which are not expected to be significantly different from those of Alternative A.

— result in an action with smaller estimated oil and gas reserves (a 4 percent reduction in the oil reserves and a 2 percent reduction in the gas reserves estimated for Alternative A is assumed). Thus, the modification could preclude the domestic production of about 0.7-2.1 million barrels of oil and 0.01-0.02 trillion cubic feet of gas estimated for Alternative A. The loss of this production represents a lost opportunity to lesses our dependence on foreign oil importation.

5. Modification B-5: Delete 24 Tracts Located on the Continental Slope

a. Description

Corpus Christi
Tract 62-72 through 62-74
Viosca Knoll
Tract A62-162 through A62-165
Green Canyon
Tract A62-168 through A62-184

These 24 tracts are located on the continental slope in water depths between 140-170 m. They are estimated to contain 9.5 percent gas and 4.2 oil of the total estimate given for Alternative A.

Concern has been expressed by EPA and others about adequate deepwater technology and regulations. Present oil industry technology is capable of exploring, developing and transporting to onshore facilities the potential reserves from maximum depths slightly beyond 1,000 feet. Beyond that depth the necessary exploratory equipment is available to drill in water depths to 6,000 feet; however, much of the production gear is still in various stages of design, development or prototype productions and it is for these reasons that it is considered premature to establish permanent regulations.

Drilling in water deeper than 600 feet has been routinely accomplished by the oil industry since the Exxon Company drilled a well in 632 feet of water in 1965. In early April 1979, a drillship completed an exploratory well in 4,441 feet of water off Barcelona, Spain in the Mediterranean, setting another new deepwater drilling record. In April 1979, Texaco and others spudded-in an exploratory well with a drillship off Newfoundland in 4,876 feet of water. During the period from 1975 to 1977, approximately 146 wells were drilled in water deeper than 600 feet--68 of them being in depths beyond 1,000 feet (Oil and Gas Journal 76(7):25).

USGS is establishing a Platform Verification Program to ensure that offshore oil and gas structures are designed, constructed and installed using standardized procedures to prevent structural failure. This will be especially useful in frontier and deepwater areas. Also, although subsea completion systems are not specifically addressed in this Program, preliminary studies related to subsea production systems are presently being conducted in the Gulf of Mexico.

While it is true that a separate set of OCS Orders covering deepwater tracts have not been promulgated; nevertheless, USGS does maintain blanket authority of deepwater tracts on a case-by-case basis in order to establish acceptable procedures for safety and environmental protection for each specific design.

b. Summary of Environmental Consequences

(1) A minor decrease in employment and related benefits.
(2) No anticipated significant effect on an already existing community infrastructure.
(3) Air and water quality effects will be precluded.
(4) A very slight reduction in recreational fishing opportunities.

(5) Preclusion of any environmental effects which would have resulted from oil and gas development.

Conclusions

Modification B-5 will:

— provides for the contingency that concern over deepwater technology would ultimately result in deletion of these tracts.

— result in an action with environmental consequences which are not expected to be significantly different from those of Alternative A.

— result in the deletion of two assumed pipeline landfalls; however, there will be little effect on the existing community infrastructure.

— result in a lesser production of oil and gas (4.2 percent of oil and 9.5 percent of gas) than estimated for Alternative A. Thus, the modification could preclude the domestic production about 0.7-2.1 million barrels of oil and 0.04-0.1 trillion cubic feet of gas estimated for Alternative A. The loss of this production represents a lost opportunity to lessen our dependence on foreign oil importation.

6. Modification B-6: Delete 43 Tracts in a Special Coordination Area (Buffer Zone)

a. Description

These 43 tracts (Louisiana tracts A62-3, 4, 8, 38, 39, 97-101, 123-126, 131, 137-141, 144, 148-155 and Texas tracts 62-6, 8, 14, 25-27, 36, 37, 39-41, 48, 50, 51) are located within 3 miles of the seaward boundary of Louisiana and Texas in water depths ranging between 4-68 meters (see visual 1 and Tract Overlay). Twenty-four of the tracts are estimated to contain about 17 percent of the gas reserves and 19 are estimated to contain about 20 percent of the oil reserves estimated for Alternative A.

These tracts are subject to special coordination between the Federal government and the Governors of the states of Louisiana and Texas.

Section 8(g) of the OCSLAA requires that at the time of soliciting nominations for the leasing of lands within 3 miles of the seaward boundary of any coastal state, the Secretary shall provide the Governor with certain available information relative to any proposed leasing activities in his area and thereafter attempt to identify any oil or gas pools underlying both the OCS and the state's lands through coordination with the Governor about that area.

If any tracts are selected for leasing which may have such underlying pools, the Secretary shall offer the Governor an opportunity to enter into an agreement concerning the disposition of revenues which may be generated by a Federal lease within such area. The Governor has 90 days in which to accept or reject the offer. If he accepts, then the Secretary shall proceed accordingly. If he rejects the offer, or if the parties cannot agree as to the disposition of revenues, the Secretary has two alternatives:

(a) he can withdraw the tracts in question from the proposed lease sale, or

(b) he may proceed with the leasing of the area and deposit in a separate U.S. Treasury account all bonuses, royalties and other revenues attributable to oil and gas pools underlying both the OCS and state lands until such time as the parties agree on a fair and equitable disposition of such revenues, or until the matter is judicially determined.

b. Summary of Environmental Consequences

Modification B-6 (buffer zone tracts) will result in all the environmental effects discussed for Alternative A except as follows:

(1) A moderate (about 14 percent) reduction in direct employment.

(2) A moderate reduction in air and water pollution.

(3) Removal of a potential risk to endangered brown pelicans and their habitat in southeastern Louisiana.

(4) A moderate reduction of a potential risk to shoreline recreation resources.

(5) A slight loss of recreational fishing enhancement.

Conclusion

Modification B-6 will:

— provide for the deletion of the special coordination (buffer zone) tracts from this proposed sale.

— eliminate the potential risk of oil spills impacting endangered brown pelicans.

— moderately reduce the potential risk of oil spills impacting shoreline recreation resources.

— result in an action with significantly less oil/gas reserves (a 20 percent reduction in oil reserves and 17 percent reduction in the gas reserves estimated for Alternative A. The loss of this production represents a lost opportunity to lessen our dependence on foreign oil importation.

C. Alternative "C" -- Delay the Sale

1. Description

Delaying this proposed sale should be considered within the context of the overall framework of ongoing OCS oil/gas development in the Gulf of Mexico region. This involves a complex infrastructure of small and large OCS-related industries which are directly and indirectly affected by all proposed OCS-related activities.

In delaying a sale, tracts are withheld for an indefinite period of time--the time assumed for this delay alternative is between 1 and 2 years--and has consequent short-term effects. Once the sale is reinstated, however, the same impacts will occur as was previously indicated in Alternative A.

During the delay period, some ongoing environmental studies in the Gulf of Mexico may be completed, and possible introduction of technological innovations in OCS operations and some lead time for local governments to plan for onshore impacts may occur. A delay could also create potential economic and environmental problems (discussed in section (IV.B.3.b.).

If the sale is delayed for completion of environmental studies in the Gulf of Mexico and they reveal adverse impacts from OCS oil and gas operations, then the delay would be environmentally beneficial as far as OCS activities are concerned. During the delay period and afterwards, if adverse impacts are discovered upon completion of the studies, foreign oil importation would increase. It should be noted, however, that five years of environmental studies by BLM have not found OCS oil and gas operations adversely impacting the environment.

The introduction of technological innovations could extend oil and gas operations into deeper waters and achieve greater resource recovery. These would provide more domestic energy production or savings, but the delay time would require alternative energy sources, principally foreign imports (see section IV.B.4.c.).

Extended lead times for local government planners could alleviate infrastructural stresses, but the sale area has an established infrastructure. A delay for this reason would be meaningless in the Gulf of Mexico area.

2. Summary of Environmental Consequences

There are both positive and negative impacts associated with this alternative. Impacts discussed in Section IV.B. would be delayed. Delaying the sale would also increase foreign imports and potential tanker

oil spills. Increased tankering and lightering operations in the Gulf could lead to anchors damaging biologically sensitive areas and offshore pipelines. If alternative domestic energy resources are used (coal, nuclear, etc.), environmental damage potentially could be greater than OCS activity impacts (see section IV.B.4.c.).

Economic activities will be impacted because of increased costs to the oil and gas industry due to rising inflation. Capital, manpower or equipment shortages could develop and further delay potential production and stress onshore employment. These increases will eventually be passed on to the consumer. Conversely, the difference between price levels at the scheduled sale date and the delayed sale date will be an irretrievable loss to the end user of potential sale production.

Many smaller companies, dependent on oil and gas production for their continual existence, could be adversely affected if this sale were delayed and have difficulty in maintaining their operations during the delay period (see section IV.B.3.b.).

Because additional structures would also be delayed, which would have been erected as a result of Alternative A, recreational fishing would be negatively impacted since the structures act as artificial reefs.

Conclusion

The major environmental impact of delaying this sale is a potential loss of employment, business income, government revenues and community services that would result from Alternative A (Hold the Sale). This would especially affect the smaller businesses which support OCS operations, and adversely affect their viability if the delay were for an extended period of time. Recreational fishing would be impacted due to a delay in additional structures being erected which act as artificial reefs. Also, if the potential production of this proposed sale is replaced by imported oil there is a greater risk of large oil spills from tankering than from pipelining.

D. Alternative "D" -- Cancel the Sale

1. Description

Although no sale has been canceled in the Gulf of Mexico in over a decade, it is addressed as an option because cancellations have occurred in other areas. Cancellation is viewed as a loss of production, and like Alternative C, must be viewed in context with the overall framework of ongoing OCS oil and gas development in the Gulf of Mexico region which over the past 25 years has evolved into a complex infrastructure of large and small OCS-related businesses.

2. Summary of Environmental Consequences

Cancellation could have the same positive effects as Alternative C, but differ in the negative ones. For a more detailed analysis, see section IV.B.4.b. In summary, positive aspects include: (1) additional time to allow for research into improved methodologies to achieve greater resource recovery; (2) continuing research into energy alternatives and conservation which may enhance recreational opportunities; and, (3) environmental studies which would gain more time to completion.

The negative aspects include: (1) increased risk of a major oil spill due to tankering of foreign oil to replace domestic production; (2) loss of an estimated $1.5 billion in OCS investment with losses in employment, income, government revenues and community services with the greatest impacts on the smaller businesses; and, (3) energy-dependent recreation activities would be affected due to insufficient fuel supplies.

Conclusion

The major environmental impacts of canceling the proposed sale are loss of employment, income and government revenues and communities services that would have resulted from Alternative A (Hold the

Sale). Foreign oil would have to be imported and could possibly cause a major oil spill due to tankering. Also, energy-dependent recreation could be affected due to insufficient fuel supplies upon which those activities depend.

E. Comparison of Alternatives

The following analysis describes the impacts of each alternative as shown in table 3. As the table displays, the impacts of Alternatives B, C and D are based on how they will affect the impacts of Alternative A.

Alternative "A" - Hold the Sale as Proposed

The following environmental impacts relate to this alternative:

1) A multiple use area exists within the sale which may create a conflict between DOD and DOI.
2) Employment will be positively impacted but will create changes and need for services to the existing community infrastructure.
3) Air quality will be slightly degraded.
4) Water quality will be slightly degraded.
5) Fisheries resources will remain viable.
6) A moderate risk of a potential impact to endangered species (pelicans and turtles) is in two localized areas.
7) Shoreline recreational resources may be negatively impacted due to industry operations, but only slightly.
8) Recreational fishing will be enhanced due to the creation of artificial reefs in the form of additional structures being erected on the OCS.

Alternative "B" -- Modify the Proposal Via Tract Deletions

Alternative B involves reducing the scope of Alternative A (Hold the Sale as Proposed) by one or any combination of 6 proposed deletion modifications. The least reduction would result from modification B-1 (5 tracts), while the maximum reduction would be attained from all 6 modifications (120 tracts).

Individually, no modification will significantly affect the overall impacts outlined for Alternative A; however, each does have specific impacts which alter the scope of impacts either positively or negatively. In addition to the environmental impacts, a potential loss of oil and gas production from the tracts is involved.

The exceptions are listed below:

B-1 Exceptions

1) This legal controversy surrounding these tracts will have been removed from the entire sale.
2) Employment may be either slightly affected or there will be no impact due to the small number of tracts.
3) Recreational fishing potential will not be increased.
4) Of the total estimated resources for Alternative A, 2 percent of gas and 5.2 percent of oil will be eliminated.

B-2 Exceptions

1) The multiple use area will be eliminated from the sale.

Table 3

	Summary Impact	Comparison of Impacts for Alternatives (Effect of Alternatives on Impacts of Alternative A)							
	Alt. A (296 tracts) (100%)	B-1 (5 tracts) (1.7%)	B-2 (37 tracts) (12.5%)	B-3 (10 tracts) (3.4%)	B-4 (6 tracts) (2.0%)	B-5 (24 tracts) (8.1%)	B-6 (43 tracts) (14.5%)	Alt. C (296 tracts) (100%)	Alt. D (296 tracts) (100%)
Multiple Use Area	−−	NA	++	NA	NA	NA	NA	NA	NA
Employment	++	0/−	−	0/−	0/−	−	−	−−	−−
(Community Infrastructure)	−	0	0/+	0	0	0	0	0/+	0/+
Air Quality	−	0	+	0	0	+	+	0	0
Water Quality	−	0	+	+	0	+	+	0	0
Fisheries Resources	0	0	0	0	0	0	0	0	0
Endangered Species	−	0	+	0	0	0	+	0	0
Shoreline Recreational Resources	−	0	+	0	0	0	+	+	+
Recreational Fishing*	+	−	−	−	−	−	−	−	−

\+ = Slightly positive
− = Slightly negative
++ = Positive
−− = Negative
0 = No significant affect
NA = Not applicable

Alternative A — Hold the Sale As Proposed
B — Modify the Proposal Via Tract Deletions
C — Delay the Sale
D — Cancel the Sale

* Based on the assumption at least one platform could be cited within the area under consideration.

2) It is assumed there will be slightly negative impact on employment by removal of these tracts which comprise 12.5 percent of the total sale. However, this will also eliminate any additional stress to the community infrastructure which may have occurred.

3) Air quality degradation will not occur.

4) Water quality degradation will not occur.

5) The potential hazard to endangered species will be eliminated.

6) Shoreline recreational resources will not be degraded due to a potential oil spill.

7) Recreational fishing potential will not be increased.

8) Of the estimated oil resources of Alternative A, 38.9 percent would be eliminated with these 37 tracts. There is no expected gas resources in these blocks.

B-3 Exceptions

1) Employment may be either slightly affected or there will be no impact due to the small number of tracts (10) involved.

2) Water quality will not be degraded.

3) Recreational fishing potential will not be increased.

4) Of the estimated resources of Alternative A, 3.9 percent of gas and 2.1 percent of oil would be eliminated with these 10 tracts.

B-4 Exceptions

1) Employment may be either slightly affected or there will be no impact due to the small number of tracts (6) involved.

2) Recreational fishing potential will not be increased.

3) Of the estimated resources of Alternative A, 2.4 percent of gas and 4.2 percent of oil would be eliminated with these 6 tracts.

B-5 Exceptions

1) It is assumed there will be a slightly negative impact on employment by removal of these 24 tracts.

2) Air quality will not be degraded.

3) Water quality will not be degraded.

4) Recreational fishing potential will not be increased.

5) Of the estimated resources of Alternative A, 9.5 percent of gas and 4.2 percent of oil would be eliminated with these 24 tracts.

B-6 Exceptions

1) It is assumed there will be a slightly negative impact on employment by removal of these 43 tracts which represents 14.5 percent of the total sale.

2) Air quality will not be degraded.

3) Water quality will not be degraded.

4) The potential hazard to endangered species will be eliminated.

5) Recreational fishing potential will not be increased.

6) Of the estimated resources of Alternative A, 17 percent of gas and 20 percent of oil would be eliminated with these tracts.

Alternative "C" – Delay the Sale

All of the impacts indicated for Alternative A will be eliminated for the period of delay. There is, however, other negative impacts which occur in the area of employment during this same period, especially to the smaller oil companies, and ancillary industries, which make up the greater portion of the sale-related business (see section IV.B.3.). Also, the risk of oil spill occurrences due to tankering of replacement foreign oil will be increased during the delay.

Alternative "D" -- Cancel the Sale

All of the impacts which would have resulted from the sale will be eliminated. Again, however, employment impacts would occur as described in section IV.4. Also, there will be an increase in the potential risk of an oil spill occurrence due to tankering of foreign oil.

III

Section III

Affected Environment

III. AFFECTED ENVIRONMENT

For purposes of this DEIS, the affected environment has been divided into four zones -- Coastal, Shelf, Slope and Deep Oceanic -- which are defined as follows:

Coastal Zone - From the inland CZM line of the state out to the Federal/State boundary in the ocean.

Shelf- Where the Lambert turns into the UTM for Texas and Louisiana, and where the 200 m line is indicated on visuals for the Eastern Gulf.

Slope - Starts where the Shelf ends and goes to Sigsbee Escarpment and Florida Escarpment.

Deep Oceanic - Beyond the Sigsbee and Florida Escarpments, or at the 3,000 m line.

Each of these zones has been discussed relative to the physical biological habitats, recreational, and economic and social activities, as they are affected by oil and gas operations.

These zones have been indicated on the overlays attached to the visuals packet.

A. Physical

1. Coastal Zone

The geology of the coastal zone is mainly a study in late Quaternary sedimentation. Most of the area is situated in the vicinity of the Gulf Coast Geosyncline where downwarping and consolidation of sediments have been occurring concurrently with deposition since the end of the Tertiary Period (refer to visuals 2 and 3).

Robert N. Bergantino's 1971 article in the Geological Society of America Bulletin "Submarine Regional Geomorphology of the Gulf of Mexico" has described in detail the continental shelf, continental slope and the Gulf floor. The following is a brief summary from that article.

The Gulf region is divided into three major geomorphic divisions: the continental shelf, the continental slope and the oceanic deep.

2. Shelf

The continental shelf is a submarine plain with a gentle slope of less than 1^{o} of varying width containing Pleistocene wave cut terraces. The lowest terraces generally lie near a depth of 130 m (see the visual "Submarine Physiography of the Gulf of Mexico").

3. Slope

The continental slope ranges from 2^{o} in the DeSoto Valley to greater than 45^{o} over limited areas of the reef-formed West Florida Escarpment. Diapirs underlie all non-carbonate slopes and have largely altered the pre-existing topography.

4. Deep Oceanic

The Gulf floor, as shown on visual 11--Physiography, is bounded on the northwest by the Sigsbee Escarpment and the northeast by the West Florida Escarpment. Along the Sigsbee Escarpment the boundary of the Gulf floor ranges from 3,000 m at the western extremity to 3,200 m at the eastern extremity. The West Florida Escarpment boundary ranges from 2,400 m along the northwest to 3,200 m along the south, as shown on visual 2--Eastern Gulf of Mexico Geologic and Geomorphic Features.

5. Oceanography

The complex circulation in the Gulf of Mexico is dominated by the Loop Current. In general, the large scale circulation in the Gulf of Mexico is attributable to four major factors: Yucatan Current, tides, winds and river discharges. The Loop Current is a major feature of the central and western Gulf. It is a continuation of the Yucatan Current that enters the Gulf of Mexico through the Yucatan Straits. Although the current shows great annual and seasonal variability in magnitude and course, in general, it penetrates some distance into the Gulf, turns clockwise and exits through the Florida Straits. The path of the Loop Current appears to be directly influenced by the topography of the Gulf of Mexico Basin. Large eddies frequently separate from the main current and drift into the western Gulf, these spin-offs decay over a period of three to six months. No significant permanent or semi-permanent shelf currents exists in the western Gulf as a result of the Loop Current.

Along the continental shelf in the Gulf of Mexico there is a general westward movement of currents. The nearshore regime in this area is influenced by several factors, among them winds, tides, offshore current flow and fresh water discharge from coastal rivers. In most areas significant winds are the major control of surface currents.

Surface currents in the western Gulf of Mexico shift seasonally and, in general, reflect the prevailing winds over the area. Currents from September through February are southwesterly with indications of an alongshore or offshore movement in November and December. A period of transition occurs in March-May when currents shift to west then to the northwest. Surface current flows north and east alongshore in June and July. Finally, in August, currents are westerly before resuming the September regime.

In conclusion, currents in the Gulf of Mexico are predominantly influenced by wind in the western portion and by density differences and the Loop Current in the eastern portion. During the summer the Loop extends far into the northern Gulf causing an easterly flow past the slope off the Mississippi Delta. A counter current caused by density gradients and wind stress flows westward nearshore along Louisiana and turns southwesterly on the Texas shelf.

The tides of the Gulf of Mexico are weakly developed and usually their observed range does not exceed 0.7 m. Semidiurnal (twice daily) tides are small; therefore, overall tides in the Gulf are considered diurnal (daily) in character. Spring tides are slightly higher, but since the range is so small, meteorological effects can completely mask tidal fluctuations. Highest mean water level occurs during the period of December through March. Tidal currents do have some small effect on flushing rates in enclosed bays, but because tidal ranges are small, currents resulting from tides are also small.

The coastline of the Gulf of Mexico is characterized as a low energy area in terms of wave power. The annual average wave heights are 0.9 m with 75 percent of all waves being smaller in height than 1.5 m.

Prevailing winds during spring, summer and early fall are from southeast and wave heights are generally less during this period. Waves associated with storms range considerably higher. During hurricane "Camille" in 1969, for example, waves 21 m high were reported offshore, with winds exceeding 322 km/hr. For more detail on physical and chemical oceanography, see section II.A.3. and 4. of FEIS 58A.

6. Climate

The climate of the northern Gulf of Mexico and adjacent coastal region is determined by four major factors: the North American Continental land mass, the Azores-Bermuda high pressure cell, subtropical latitude and the relatively warm waters of the Gulf of Mexico itself. The principal influence is the Gulf, which results in a maritime tropical climate for the region.

During the winter, polar continental air masses move southward into the Gulf of Mexico causing occasional sudden drops in temperature. As these cold fronts reach the Gulf of Mexico, the maritime tropical air flowing northward causes the fronts to abate and become stationary. These stationary fronts are favorable for the formation of low centers that often move west to east along the Gulf Coast or more inland

producing low clouds and rain. The cold continental air masses have a tendency to lower the sea surface temperature offshore. The cold water temperatures cause the formation of advective fog in coastal areas from November to March.

By spring, the Bermuda high develops its influence over the region thus improving the weather considerably. The ridge of high pressure usually blocks the movement of storm systems from the west. Occasionally, tropical disturbances and easterly waves will appear in the Gulf of Mexico by early summer.

During the summer, southerly winds of the Bermuda high bring warm moist tropical air onshore. Daily shower activity occurs in nearshore waters and along the coast with most activity in the afternoon. Westerly and northerly winds generally bring periods of hotter and drier weather into the region.

Easterly waves and tropical storms appear in the Gulf during late summer and early fall. The principal paths of tropical storms into the Gulf are through the Yucatan Channel and Straits of Florida. Over half of these tropical storms become hurricanes during this season. During October and November, the Bermuda high loses its strength and allows continental air to again exert influence on the Gulf of Mexico and coastal region.

Near the coast, winds are more variable than over the open waters because the coastal winds fall more directly under the influence of the moving cyclonic storms that are characteristic of the continent and because of the sea and land breeze regime.

Average annual precipitation along the Gulf Coast increases from approximately 69 cm at Brownsville to over 102 cm at Galveston, and 137 cm at New Orleans. Rainfall is fairly evenly distributed throughout the year, with the greatest amounts occurring during the months when the winds are predominantly out of the southeast and south, namely June, July and August. This is not to imply a continuity of precipitation for the south Texas region. The month of maximum rainfall for most locations is July; however, at Brownsville the record maximum is in September. Winter rains are associated with the frequent passage of frontal systems through the area. Rainfalls are generally slow, steady and relatively continuous, often lasting several days. Snowfalls are rare, and when frozen precipitation does occur it usually melts upon contact with the ground. Incidence of frozen precipitation decreases with distance offshore and rapidly reaches zero.

The warmer months usually have convective cloud systems which produce showers and thunderstorms; however, thunderstorms of this type rarely cause any damage or have attendant hail.

Warm, moist Gulf air blowing slowly over chilled land or water surfaces brings about the formation of the fog. The period from November through April has the highest frequencies of low visibilities. Generally, coastal fogs last three or four hours although particulary dense sea fogs may persist for several days.

Visibility offshore Louisiana is reduced to less than 5 km on a monthly average of 4 percent of the time. Poorest visibility conditions occur during winter and early spring when visibility is reduced to less than 5 km between 8 percent and 10 percent of the time.

The largest and most destructive storms affecting the Gulf of Mexico and adjacent coastal zones are tropical cyclones. These have their origin over the warm tropical waters of the central Atlantic Ocean, Caribbean Sea or southeastern Gulf of Mexico. They occur most frequently between June and late October and there is a relatively high probability that tropical cyclones will cause damage in the Gulf of Mexico each year.

Damage from hurricanes results from high winds and, particularly in the coastal areas, the storm surge or tide which is an abnormally high rise in water level. Maximum surge height at any location is dependent on many factors including bottom topography, coastline configuration and storm intensity, but can reach 6 to 8 meters. Hurricane "Camille" was the most severe hurricane in recent Gulf history, with top winds exceeding 322 km/hr, and barometric pressure in her eye as low as 68 cm (26.6 inches) of mercury. For more detail on climate in the Gulf of Mexico area, see section II.A.2. of FEIS 58A and Visual No. 10.

B. Biological Habitats

1. Coastal Zone

The Gulf Coast is ringed with marshes and estuaries on which much of the nearshore biota is closely linked. Many of the estuaries and some of the nearshore areas in the northern Gulf of Mexico have marine grass beds. For a more thorough discussion of marshes, estuaries and barrier islands, and seagrasses see FES Sale 58, Volume I, pp. II-43-45, and FES Sale 65, Volume I, pp. II-50-52. In the western Gulf the coastal zone area corresponds to the white shrimp grounds of Chittenden and Moore (1977). This zone is characterized by soft sediments and estuarine associated fauna, dominated by croakers *(Micropogon undulatus)* and white shrimp *(Penaeus setiferus).* In the eastern Gulf the zones are not as clearly defined.

2. Shelf

West of the Mississippi River area the shelf corresponds to the brown shrimp grounds of Chittenden and McEachran (1976). This area is characterized by non-estuarine-associated ichthyofauna and is dominated by the longspined porgy *(Stenotomus caprinus).* The shelf is reported to support a higher biomass than the nearshore white shrimp grounds.

In the eastern Gulf the DeSoto Canyon has unique areas of high relief and reefal assemblages. Recently three portions of the canyon have been surveyed: the northern rim, 54-60 m in depth (Shipp and Hopkins, 1978), the western (68-375 m) and the eastern (72-115 m) flanks. Shipp and Hopkins (1978) observed limestone ledges bordered by sandy flats. Relief of the ridges increased to 10 m to the southwest. They reported the ledges become discontinuous and many "spire-like" ledges of 10-15 m relief were evident on fathometer records.

Farther to the southwest and in somewhat deeper water a BLM-funded study (Final Report Contract AA551-CT8-22) observed irregular reef-like features and pinnacles up to 9 m in relief. These occurred around 80 m and 115 m. Coral *(Oculina)*, sea whips, sponges, and reef fish concentrations were observed on both the northern rim and western flanks.

The eastern flank was 72-115 m and tall pinnacles and irregularities occurred between 86-90 m. One pinnacle encountered rose 11 m above the seafloor. These outcrops were encrusted by sponges, sea fans, and sea whips, and congregations of tropical reef fishes were reported.

It can be postulated that these outcrops probably occur to the northeast through the blocks proposed for lease.

Pelagic nekton such as cephalopod molluscs, billfish, tunas, sharks and mackerels range over the shelf. For a more detailed treatment of plankton, nekton and benthos see FES Sale 65 and FES Sale 58.

In the region of the shelf break the central Gulf is characterized by a series of "topographic highs", geologic features rising out of 100 m-200 m to various depths and trending east-west along the break. Many of these are the surface expression of salt domes, and nearly all are hard, rocky outcrops. Many are drowned coral reefs. The hard, more or less vertical surfaces provide habitat and food for a wide variety of organisms, and it has been found, largely through BLM-funded studies, that, at similar depths, all of these banks contain similar biological communities. The East and West Flower Garden Banks off Texas and Louisiana rise closer to the water's surface than the others and are the only two which contain living hermatypic (reef-building) corals. For complete descriptions of these biologically important areas, see Bright and Pequegnat, 1974; and Bright and Rezak, 1976, 1978a and 1978b.

Two of these banks lie within tracts offered in this proposed sale: Sonnier Banks in Tract A62-54 and Sackett Bank in Tract A62-136. These and three more banks have tracts located near enough to them that there is a possibility of harm to the biota of the banks caused by oil and gas activities: Sonnier Bank, Tracts A62-53 through A62-57; Rezak Bank, Tract A62-62; Diaphus Bank, Tract A62-104; Sackett Bank, Tracts A62-135 and A62-136; and Applebaum Bank (formerly known as Little Sister Bank), Tract 62-69.

Detailed descriptions of Sonnier Banks and Sackett Bank may be found in Bright and Rezak, 1978a. Rezak and Diaphus Bank are being studied under a BLM contract with the final report due in late 1979; like Applebaum, it is believed that these banks will show similar biotic assemblages to the other studied shelf break bank at corresponding depths.

In the western Gulf (from south of Freeport, where the break turns to the south) such deep- and clear-water features are not found; rather, a series of low relief banks are located further up the shelf rising only on the order of 10 m in 60-80 m water depth. Compared to the banks of the central Gulf, these banks have depaurate flora and fauna (Bright and Rezak, 1978a). More sediments are found on the banks, and the water is generally more turbid than that found at the central Gulf banks. These banks, while important biologically, are not nearly so rich and diverse as those of the central Gulf. No banks in this area will be affected by this proposal.

Unfortunately, much less is known about the seafloor features of the eastern Gulf, but it is known that the Florida shelf has extensive "hard bottom" areas, which may be "live bottom" areas if water conditions and depth permit the growth of rich biological communities. Live bottoms are defined as those areas which contain biological assemblages consisting of such sessile invertebrates as sea fans, sea whips, hydroids, anemones, ascidians, sponges, bryozoans, or corals living upon and attached to naturally occurring hard or rocky formations with rough, broken, or smooth topography; or whose lithotope favors the accumulation of turtles and fishes.

The available evidence indicates that these areas are sparsely scattered throughout the shelf of the eastern Gulf in small patches (Bright and Jaep, 1976). The Florida Middle Grounds are probably the best known and most biologically developed of these areas, with extensive inhabitation by hermatypic corals and related communities; however, none of the tracts to be offered in this proposal are in the vicinity of the Middle Grounds.

Tracts A62-185 through A62-221, in the Destin Dome Area offshore Florida, quite likely contain live bottom areas. The water depths in these tracts range from 52 m in the northeast to 148 m in the southwest, and rich live bottoms would be expected in the shallower areas. These rich biological communities, if present, would be protected from potentially harmful impacts of oil and gas activities by the stipulation described in Section I.B.5.a.

3. Slope

This discussion of slope biota is taken largely from a BLM-funded study "Ecological Aspects of the Upper Continental Slope of the Gulf of Mexico" (Pequgnat et al., 1976).

The slope is a transitional environment influenced by processes on the shelf and the abyssal Gulf. This transition applies more to the pelagic than the benthic realm. The lower boundary of the euphotic zone is about 50-60 m, thus the entire slope is in darkness. The lower limit of light penetration, 50-60 m, may be taken as the lower depth limit of photosynthetic activity of phytoplankton.

The general conclusions which may be reached are as follows: 1) the shelf phyto- and zooplankton are more abundant, more productive and seasonally more variable than the open Gulf plankton; 2) in these respects the slope plankton is intermediate, but closer to the condition of the open Gulf; and 3) each of the three regions is characterized by some species which are more or less specific to the particular zones. Some east-west differences have been noted, especially among the diatom species, and these have been interpreted as representing the differences between normal Gulf waters and those influenced by Mississippi River water.

The planktonic biota of the surface waters may be viewed as primarily transitional between that of the shelf and that of the deep Gulf; such is not the case with the benthic fauna. Most of the benthic inhabitants of the slope are not found elsewhere, and together they constitute a complex, abundant true slope fauna.

4. Deep Oceanic

The deep oceanic area, as defined previously, is a considerable distance from the proposed lease area. Because of this distance the possibility of impact appears low. One could speculate that an oil spill could become entrained in the Loop current and be transported to this deep oceanic area either by drifting with current or as the current itself migrates southward in the winter; however, these possibilities are very remote.

C. Recreation

1. Coastal Zone

The northern Gulf of Mexico coastal zone is one of the major recreational areas of the United States, particularly in connection with saltwater fishing (bay, surf and pier) and beach-oriented activities. Major marine recreational finfish species sought in the coastal zone include seatrout, drum, croker, flounder and sheepshead. Additionally, shellfishing (especially crabbing and shrimping) is an important recreational activity among coastal residents.

The shorefront along the coasts of Texas, Louisiana, Mississippi, Alabama and the Florida panhandle displays a diversity of natural landscapes and seascapes. Barrier islands, coastal beaches, bays, sounds, river deltas and marshes, along with a subtropical climate, provide an ideal setting for outdoor recreation and tourism. Visual 4 depicts the major state and nationally recognized public interest areas. Included are publicly-owned areas like national seashore, parks, beaches and wildlife lands, as well as specially designated preservation areas, such as historic and natural sites and landmarks, wilderness areas, wildlife sanctuaries, and scenic rivers. Commercial and private recreational facilities and establishments such as resorts, marinas, amusement parks, and ornamental gardens also serve as primary interest areas and support services for people who seek enjoyment of the recreational resources influenced by the Gulf of Mexico. A general discussion of the different categories of areas found along the Gulf Coast which provide recreational opportunities in the coastal zone and indications on the level of use by residents and tourists are described in Section II.C. of the Final Environmental Impact Statements for OCS Sales 58A and 65. To summarize, the diverse environments found in coastal areas where water and land converge are a magnet for leisure pursuits. The coastal beaches, barrier islands, estuarine bays and sounds, and tidal marshes, in the area of the proposed sale, from Port Isabel, Texas to Cape San Blas, Florida are intensively utilized for recreational activity by residents from the Gulf South and tourists from throughout the nation as well as from foreign countries. The largest concentration of coastal recreators will be found on Gulf coastal beaches most closely associated with urban populations and resort communities throughout the spring and summer months.

2. Shelf

The open Gulf of Mexico, or that area extending from a few miles offshore to the shelf break, encompasses a broad expanse of saltwater which is of intense interest to sports fishermen, generally classed as "deep sea" fishermen, and a small but rapidly increasing number of scuba divers. Access to the open Gulf for recreational purposes requires a boat; therefore, a substantial portion of coastal boaters owning vessels of 16 feet or greater venture into the open Gulf in their private vessels. Other coastal residents, as well as many tourists, rent spaces on charter or headboats for the purpose of deep sea fishing in the northern Gulf of Mexico.

Studies and reports by the National Marine Fisheries Service (Ridgley, 1975), the U.S. Coast Guard (U.S. Dept. of Transportation, 1978) and Texas A&M (Ditton & Graefe, 1978) have estimated between 4-12 percent of the boating population of the Gulf states use their craft in saltwater or venture offshore in the Gulf of Mexico. Based on the most recent boating registration statistics (DOT, 1978) which account for state registration of almost 2 million motorboats from Texas to Florida, between 80,000 and 240,000

private recreational boats may be boating on the continental shelf of the Gulf of Mexico. Additionally, approximately 200 recreational fishing boat-for-hire businesses which offer deep sea fishing or scuba opportunities are located along the Gulf Coast from Port Isabel, Texas to Cape San Blas, Florida.

The National Marine Fisheries Service, in a study by Mabrey, Deuel and Kirsch (1977), estimated approximately six million saltwater fishermen spent a quarter of a billion dollars to catch over 230,000,000 pounds of fish in the northern Gulf of Mexico in 1974. Several studies have determined the most sought after fish in the offshore waters of the Gulf include sea trout, drum, croaker, snapper, grouper, mackerel, cobia and billfish.

The NMFS is currently sponsoring a national survey of marine recreational pursuits and will publish more reliable data on the level of marine recreational activity offshore in the Gulf of Mexico sometime in late 1980. The regional surveys on marine recreation conducted by the NMFS provide very little information on specific sites offshore of interest to marine recreators; it is generally known, however, that fishing and scuba interest offshore is focused around natural and artificial reefs. Visual 4 depicts many of the undersea features that attract marine recreators. The Gulf of Mexico Fishery Management Council and all the Gulf coastal states, except Louisiana, have ongoing programs to encourage the development of artificial reefs to facilitate and enhance offshore marine recreational fishing. Approximately twelve liberty ship reef sites have been established off Texas, Mississippi, Alabama and the west coast of Florida. Many additional artificial reefs resulting from shipwrecks or the purposeful build-up of miscellaneous rubble such as tires, concrete and junked car bodies serve as the principal focus of some recreational pursuits offshore. Additionally, the more than 2,300 emergent oil and gas production facilities, most of which exist offshore Louisiana, serve as primary recreational destination areas for offshore marine recreational interest. The study by Ditton and Graefe in 1978 on fishermen use of artificial and natural reefs off southeast Texas determined oil and gas structures are the most popular offshore recreation destination areas, attracting 87 percent of the boats that fished offshore in their study area.

Additional information on offshore recreational use can be found in the FEIS for OCS lease sales 58A and 65. To summarize, marine recreational fishing and scuba interest on the northern Gulf of Mexico continental shelf is (1) believed to be site specific; (2) increasing in popularity; (3) very productive and rewarding to participants; (4) has a recognizable effect on coastal economies.

3. Slope

The continental slope extends from about fifteen miles off the Mississippi Delta to several hundred miles from the nearest shoreline in some areas of the Gulf. Located along the shelf break-slope transition zone are several topographic features of special biological significance. These areas are noted on Visual 4. These special slope features are natural reefs noted for their innate beauty, high relief, biological diversity and fishery resources. Those shelf-slope features extending farthest from shore in the clear water zone of the Gulf contain unique features such as living coral and tropical fishes unknown in other natural areas of the north central Gulf of Mexico. These are primary recreational resources known to attract some scuba interest.

The East and West Flower Gardens located about 100 miles south of Sabine Pass are the most noteworthy of the special features located along the shelf-slope transition zone. The NMFS is recommending marine sanctuary status for the East and West Flower Gardens and has published a draft environmental impact statement which provides a detailed description of the Flower Gardens' environment and indicates several hundred annual visits are made to the area by scuba divers and sports fishermen (U.S. Dept. of Commerce, 1979).

Most of the special shelf-slope features attract very little site specific recreational use because of the time, distance, and safety factors involved in reaching them; the shelf-slope break is noted, however, as fertile ground to encounter big game fish and is frequented by hundreds of yachts trawling for billfish, especially where the shelf break comes closest to shore. South Pass, off the Mississippi Delta, and the DeSoto

Canyon, south of Fort Walton Beach, are noteworthy billfishing areas attracting many trophy fishermen. Recreational use seaward of the shelf-slope transition zone is negligible.

4. Deep Oceanic

Recreational interest is undocumented in this vicinity of the Gulf of Mexico and is unlikely to develop in the foreseeable future.

D. Economic and Social Activities

1. Land Use

a. General Characteristics

The Gulf of Mexico coastal region which might be affected by the proposed lease sale extends from the mouth of the Rio Grande at the U.S.—Mexico border to the Florida Gulf Coast at Apalachee Bay south of Tallahassee. Much of the coastal area is marked by barrier island formations similar to the Atlantic shoreline; there is also the vast delta formation of the Mississippi River.

The Texas Gulf Coast area is characterized by a nearly continuous chain of barrier islands and beach separated from the heavily indented mainland coastline by an extensive series of inland bays. The principal rivers flowing into the bay indentations along the Texas coast are the Nueces, San Antonio, Lavaca, Colorado, San Jacinto, Trinity, and the Sabine along the Texas—Louisiana line. The ocean shore of these barrier islands is composed mostly of sandy beaches. Of the total state shoreline of about 2,500 miles, approximately 380 miles are sandy beach. The vast bay/estuary zone contains areas of marsh and wetland similar to that found along the Atlantic coast as generally described in the 1970 National Atlas of the U.S.

The Louisiana Gulf Coast area is characterized by vast areas of saltwater marsh lying at or near sea level either partially submerged or subject to tidal overflow, pocked with shallow lakes, bayous, sounds and bays. The entire area is interlaced with a network of channels and canals, and occupies about 3.7 million acres in a broad band across most of the state's interface with the Gulf. This band is from 20 to 30 miles wide in the western portion of the state's coast. The eastern portion of the Louisiana coast is dominated by the Mississippi River Delta which has a frontage over 150 miles along the Gulf, and extends a similar distance inland from the present river mouth. Because of the coastal configuration, there is a general lack of extensive areas of sandy beach; however, throughout the entire coastal area of the state there are many difficult access pockets of beach totalling approximately 835 miles of the overall 1,943 mile state shoreline. Saltwater marsh grass and reeds, belts of wooded swamp and strips of natural levees are the major characteristics of the area.

The Mississippi Gulf Coast area consists mostly of marsh areas and artificially maintained beaches; only on the eastern portion of the state's Gulf shore do narrow marginal natural beaches dot the coastline. The small sandy offshore barrier islands from the actual coastline of the Gulf and are separated from the mainland by the Mississippi Sound. All except Cat Island have beaches on both the Gulf and Sound shorelines, with marsh in the central portion. The Gulf shoreline of these islands totals about 33 miles of which 27 miles are beach. The mainland contains two landlocked bays, Back Bay of St. Louis Bay, as well as the Pascagoula River estuary. The total non-Gulf shoreline of the state's coast is 214 miles in length of which about 70 miles are beach.

The Alabama Gulf Coast area varies from sandy coastal beaches to tidal marshes in the two counties bordering the Gulf, and is dominated by the large indentation of Mobile Bay, which is almost entirely enclosed by barrier formations. The total Gulf shoreline of the barrier formations is all beach and is 46 miles in length. Behind these formations are shorelines of mixed marsh and beach; of the 306 miles of bay/sound shoreline of Alabama, 181 miles consist of beach, the remaining being marsh and wetland.

The Florida "Panhandle" Gulf coast area extends from the Florida-Alabama line eastward to the Ochlockonee Bay, which is located at the west end of Apalachee Bay. This area is characterized by wide sandy beaches, and barrier islands backed by dunes. Most of the beach material along this reach is white sand composed primarily of quartz. Of the total 1,063 miles of shoreline within this area, 219 miles is ocean/Gulf beach that is all sand, and 551 miles is bay/estuary beach. The remaining 293 miles of shoreline consists of marsh.

The listing below indicates the total beach shoreline in miles for the five states discussed in this section.

GULF COAST AREA	BEACH (Miles)	TOTAL SHORELINE (Miles)	PERCENT BEACH
Texas	380	2,500	15.2
Louisiana	835	1,943	43.0
Mississippi	97	247	39.3
Alabama	249	352	70.7
Florida "Panhandle"	770	1,063	72.4

b. Shoreline Land Ownership

Shoreline ownership on the Gulf Coast area is predominantly private, as indicated below. Ownership by the Federal Government is extremely limited in the Mississippi and Alabama areas; however, greater concentrations are located in the Florida Panhandle (military-oriented, particularly at Pensacola), Louisiana Gulf Coast (wildlife conservation-oriented), and Texas Gulf Coast (recreation/wildlife-conservation-oriented) areas. Non-Federal public (state/local) ownership is greatest in the Louisiana shoreline reaches where the state owns several wildlife conservation management areas.

LAND OWNERSHIP OF THE GULF OF MEXICO REGION SHORELINE

GULF COAST AREAS	TOTAL LENGTH OF SHORELINE (MILES)	FEDERAL (MILES)	(%)	STATE/LOCAL (MILES)	(%)	PRIVATE (MILES)	(%)
Texas	2,500	390	15.6	50	2.0	2,060	82.4
Louisiana	1,943	245	12.6	332	17.1	1,366	70.3
Mississippi	247	33	13.4	43	17.4	171	69.2
Alabama	352	2	0.6	13	3.7	337	95.7
Florida Panhandle	1,063	221	20.8	107	10.1	735	69.1

c. Coastal Land Use

The coastal area of the Gulf of Mexico is characterized by a natural patter of barrier islands, bays and other estuaries, wetlands (swamp and marsh) and uplands as previously described. Interspersed within, and in some cases superimposed on this natural pattern of undeveloped open space, is the human environment consisting of uses and activity systems such as: agricultural areas; metropolitan and urban areas; transportation, utilities and communication systems; parks and recreational areas; mineral extraction, business and industrial activities; residential and institutional activities; and forest, wildlife and aquatic conservation areas. Agricultural and undeveloped open space uses (e.g., parks and recreation areas; forest, wildlife and aquatic conservation areas) are the predominant land and water use along the coast in terms of area and

length of shoreline (see visuals 4 and 4E). But it is the metropolitan and urban areas, the centers of industrial, business and government activities, which dominate the region from an economic and social standpoint. About three-fourths of the Gulf coast's total population reside within the urban areas which account for less than 5% of the region's total land area. Most business, industrial, public and semi-public uses are located in the region's urban areas and small towns. However, there is considerable business and non-farm residential development scattered throughout the region on its roads and highways. Agricultural land use is important in several sections of the Gulf coast, particularly in Texas where extensive areas of cropland with pasture and grazing, and range and ranch land is found. Numerous recreation and conservation areas and historic sites are also located in the coastal regions. A more detailed description of coastal zone land use for each Gulf Coast state is presented in the following paragraphs.

The land use along the Texas Gulf Coast is variable in type and intensity on both the mainland and the barrier formations. Over 70 percent of the total shoreline is undeveloped as indicated below; however, the areas of developed shoreline vary from recreation-oriented, resort/vacation cottage or marina facilities to the intensely developed urban industrial-commercial land uses.

Gulf Coast Area	Public Recreation (Miles)	Private Recreation (Miles)	Non-Recreation Development (Miles)	Undeveloped (Miles)	Total Miles
Texas	406	162	112	1,820	2,500
Louisiana	21	32	50	1,840	1,943
Mississippi	31	106	9	101	247
Alabama	32	210	5	105	352
Florida Panhandle	99	521	166	277	1,063

The land use on the barrier formations is generally a function of proximity to population centers and availability of access. The beaches facing the Gulf are generally suitable for recreation-oriented activities. Padre Island, which stretches from the U.S.-Mexico border north to near Corpus Christi Bay, is now a National Seashore and retains its natural conditions, except for recreation facilities at its north end. Some areas to the north and south however, are being rapidly developed for residential and commercial uses or are under similar development pressures. Mustang Island is also a highly developed recreation center for the Corpus Christi metropolitan area, with beach homes, resorts, water-oriented recreation facilities and commercial establishments. Galveston Island and Bolivar Peninsula contain the Galveston urban area, and both are highly developed. The Galveston Bay area contains the largest concentration of shoreline development on the entire Texas coast, consisting of commercial and residential uses, and large industrial complexes which relate to fishing, shipping, and offshore oil and gas exploration and production. The largest port facilities of the entire Gulf Coast region are located here, with the other significantly developed area being Corpus Christi.

The Louisiana Gulf Coast is largely undeveloped along the shoreline, with more intensive land uses concentrated in those inland areas more suitable for development. The vast, broad areas of coastal marsh preclude beach-oriented activities in most areas due to the general lack of sandy beaches and the lack of access to shoreline areas. Existing land use consists of small communities oriented to the seafood industry, and support of offshore oil and gas operations. Severe developmental constraints, including susceptibility of hurricane surges, have kept permanent shoreline developments to a minimum. Industry in the coastal zone is dominated by petroleum refining, petrochemical production, ship building, food processing (including seafood), and primary metals, with petroleum refining and petrochemicals being the most significant. Activities relating to the extraction, transportation and processing of oil and gas (including the offshore component) are significant land uses in the coastal zone. The majority of oil and gas wells are in swamp and

marsh areas, and most of the state's total production comes from the coastal zone parishes. Agriculture, primarily rice and sugar cane production, is also a significant activity in the coastal zone.

The Mississippi Gulf Coast land use is marked by a diversity of a generally highly developed mainland shoreline on the Mississippi Sound, and a generally undeveloped shoreline on the barrier formations facing the Gulf. Part of these barrier formation islands are now within the Gulf Islands National Seashore. Very little differentiation remains between communities along the coastline, where a high density urban corridor has recently taken form due partly to great expansion of the tourist-recreation industry. The only major breaks in this linear development are the result of natural features such as bays, estuaries, rivers and tidal marshes.

On the Alabama Gulf Coast, topography has imposed historical constraints on development patterns and land use allocations. Mobile Bay and its delta to the north, as well as other low elevation areas subject to flooding, are generally timbered and undeveloped, while development has been directed to higher elevations, both along the coast and inland. The coastal areas, especially the barrier formations, are coming under increased pressure for commercial and recreational development. Many smaller communities exist which consist of residential areas, cottages, hotels and motels which accomodate tourists and seasonal visitors. Some of these barrier formations are included in the Gulf Islands National Seashore, however, and will retain their natural conditions.

The Florida Panhandle Gulf Coast area land use is in part a function of the physical differences of the barrier formations and the mainland bay areas. Shoreline uses are highly variable. The barrier islands are generally suitable for beach recreation-oriented activity and considerable lengths are used for recreation purposes. In recent years, land use dedicated to the tourist and recreation industry has greatly increased. The area's development, however, is also focused on its mainland shoreline with naval activities and shipping and marine resources predominating. Industrial development has also gravitated to the area because of available transportation and production facilities. The Pensacola Bay area contains a long uninterrupted stretch of urbanized, industrialized shoreline. The most intense tourism and recreation-related land use is on the Gulf to the west of Panama City, where an almost unbroken commercial strip development consisting of motels, condominiums, restaurants, summer homes, etc., has developed. East of Panama City, however, the quality of the beach deteriorates, coastal land use becomes much less intense, populations are lower, and only a few summer homes exist.

2. Population and Housing

The population and housing of the Gulf states of Texas, Louisiana, Mississippi, Alabama and Florida are dependent upon the general economy of the area. Since the 1950's the area has experienced continued growth of manufacturing, financial institutions, internal markets and urban centers in conjunction with the development of industry resulting in rapid population growth, including workers who would have otherwise moved to other parts of the country. The growth rate in these five states during 1970-1975 was more than twice the growth rate of the South as a whole and almost three times the growth rate of the total U.S. population.

Table 4 displays information about population and housing for the Gulf coastal areas of the five states that are likely to be impacted by the proposed sale and subsequent development. For further information, the reader is directed to the final environmental impact statements for sales 65, 51, 58 and 58A. For further reference see the Statistical Abstract of Louisiana 1977, the Mississippi Statistical Abstract 1978, the Florida Statistical Abstract 1978, the Alabama Statistical Abstract 1978 and the 1978 Rand McNally Commercial Areas and Marketing Guide.

3. Employment and Income

Table 4 also shows recent and historic values for employment and personal income in the coastal states and counties. Substantial increases have occurred between 1970 and the latest available years. This

Table 4

Selected Socio-Economic Characteristics for States and Coastal Counties

	Population (000)		Housing (000)		Personal Income ($000,000)		Employment (000)	
	1970	1977	1970	1975	1970	1977	1970	1976
Alabama	3,444.2	3,690.0	1,034.1	1,229.3	8,853.0	18,699.4	1,225.6	1,453.8
Coastal[1/]	317.3	353.8	91.8	110.0	849.9[E]	1,808.7	107.6	133.1
Florida	6,791.4	8,717.3	2,489.0	3,228.6[E]	25,595.6	56,496.0	2,641.0	3,302.7
Coastal[1/]	280.6	327.7	91.8	109.2[E]	864.3	1,754.0[76/]	89.7	122.1[77/]
Louisiana	3,641.3	3,971.7	1,150.2	1,302.4	11,285.0	23,187.0	1,290.0	1,619.0[78/]
Coastal[1/]	1,499.9	1,618.0	477.0	539.3	5,153.2	10,556.2	507.9	705.1
Mississippi	2,216.9	2,400.2	697.1	783.5	5,753.0	13,019.0	787.7	972.4
Coastal[1/]	88.0	115.2	27.6	36.5	830.5	1,875.0[E]	29.2	51.0
Texas	11,196.7	13,133.1	3,830.0	4,590.3	40,213.0	87,592.7	4,141.5	5,706.0[78/]
Coastal[1/]	2,876.9	3,029.3[76/]	961.0	974.0	11,139.8	26,390.0	1,163.6	1,549.0[78/]

E - Estimated

1/ - Counties:
- Alabama - Mobile
- Florida - Bay, Escambia
- Louisiana - Calcasieu, Cameron, Iberia, Jefferson, LaFourche, Orleans, Plaquemines, St. Bernard, St. Martin, St. Mary, Terrebonne, Vermilion
- Mississippi - Jackson
- Texas - Aransas, Brazoria, Calhoun, Cameron, Chambers, Galveston, Harris, Jefferson, Kleberg, Matagorda, Nueces, Orange, San Patricio, Willacy

76/ 1976 figures
77/ 1977 figures
78/ 1978 figures

growth is consistent with the South's changing image from a rural to an urgan based economy. The recent three major employment sectors vary in rank for each state, but they are from these four sectors: manufacturing, wholesale/retail trade, services and government. Employment and income are further explained in the final EIS's for Sales 65, 51 58 and 58A.

4. Oil and Gas Infrastructure

The offshore infrastructure for oil and gas production in the western Gulf is the most developed in the world. It includes oil refineries, petrochemical and gas processing plants, supply bases for offshore services, platform construction yards, pipeline yards, and other industry-related installations. Although this development is mostly evident in offshore Louisiana, it also stretches to the west along the coast of Texas, thinning out along the southern coast (see visual 7).

Offshore in the eastern Gulf, the infrastructure stretches as far as Pascagoula. Despite a twenty year history of exploration, most areas in the eastern Gulf remain largely undeveloped in terms of OCS development or infrastructure. For a further discussion see the Final EIS for Sale 65. In addition, the Description of the Environment sections of EIS 51, 58 and 58A contain extensive information on the oil and gas industry in the Gulf.

A comprehensive source of OCS exploration, leasing, development and production and revenue data is the annual "Outer Continental Shelf Statistics" published by the U. S. Geological Survey, Conservation Division, Reston, Virginia. The most recent publication date is June 1978. A brief summary is shown in table 5.

5. Transportation

Most of the goods transported in the Gulf move by water or pipeline. Much of it moves by barge along the Intracoastal Waterway all along the Gulf and up and down the many rivers in the Gulf States. Grain and other products of the Mississippi Basin come down to the Gulf, while foreign goods and products from other parts of the country flow back up the river and along the coast.

Pipelines

Pipelines form a maze throughout the Gulf transporting crude oil and gas from offshore and onshore production sites to processing plants and refineries (see visual 7) and from there the petroleum products are shipped all across the nation to final consumers. For a better understanding of this flow and its magnitude the reader is directed to the Final EIS for Sale 65, figures III-1, 2 and 3 on pages III-13, 14 and 15.

Ports

Houston and New Orleans are two of the biggest and busiest ports in North America. The following table is derived from highlights of U. S. Export and Import Trade, U. S. Department of Commerce, Bureau of Census, March 1978.

	Year Cumulative to Date (Millions)		March 1978 (Millions)		
	Exports		Imports		Petroleum Products
	dollars	pounds	dollars	pounds	dollars
Houston	2,425.3	20,331	3,748	67,388	2,698.8
New Orleans	3,365	37,632	3,443	57,462	2,008.2

Table 5

Gulf of Mexico OCS Activities Summary (1954-1977)

	Louisiana	Texas	MAFLA[1/]
Exploration Permits			
1963-1969	1,417	673	188
1970-1977	1,518	593	235
Leases			
1954-1977	1,852	660	108
Well Status			
Total Wells	13,576	1,094	108
Wells Completed	7,422	236	26
Plugged/Abandoned	5,704	665	81
Active/Shut-in	7,585	145	27
Production/Value			
Oil & Condensate (10^6 bbls)	4,374.9	21.7	0
Gas (10^6 mcf)	33,494.3	1,397.6	0
Gasoline & LPG (10^6 gal)	13,765.8	445.3	0
Production Value (10^6 $)	$32,347.3	$ 431.3	0
Royalty Value (10^6 $)	$ 5,246.9	$ 69.6	0

1/ Mississippi, Alabama, Florida

Source: "OCS Statistics," USGS, June 1978.

New Orleans ships a large portion of U. S. grain exports and Houston imports large amounts of oil, but Houston also ships grain and refineries processing foreign crude line the banks of the Mississippi.

Galveston, Mobile, Pascagoula and other smaller industrial ports build ships and handle other manufacturing including pipeline and rig building yards. Many smaller ports handle the large commercial fishing and recreational fleet of the Gulf.

Shipping

Gulf shipping is both intracoastal and international with barges and supertankers competing for harbor and river space. Ships carrying midwestern grain pass tankers loaded with Mideastern crude. In the open Gulf, ships have to compete with barges, fishing vessels, oil and gas platforms, supply boats and recreational vessels; accidents are rather rare, however, and safety fairways are well known. For a further discussion see EIS's for Sales 65, 51, 58 and 58A.

6. Fisheries Resources

Fisheries resources provide a viable industry in the Gulf of Mexico. In 1977 the ex-vessel value of commercial landings in the Gulf was nearly a half billion dollars. This figure does not include satellite industries which could be expected to increase this by a factor of four. Over the past five years the value of Gulf landings has ranged from 27 to 30 percent of the national total. The major fishing ports located in the proposed sale area, based on value of commercial landings are: Brownsville-Port Isabel, Aransas Pass-Rockport and Freeport, Texas; Dulac-Chauvin and Cameron, Louisiana; and Bayou La Batre, Alabama.

Employment in processing and wholesale establishments in 1975 was 11,034 persons and there were 26,560 persons reported as fishermen.

Section IV

IV

Environmental Consequences

IV. ENVIRONMENTAL CONSEQUENCES

A. General Impact Producing Factors and Related Environmental Consequences

The OCS oil and gas development activities which would result from the proposed sale could eventually result in a variety of impacts on the natural environment, on air and water quality, on land use patterns, on the aesthetic quality of the coastal zone, on the adequacy of local and regional infrastructure, and on the local and regional economic and social well being. This section provides a general overview of how routine operations and occasional accidents attendant to OCS oil and gas development generate effluents or impact agents which, either directly or indirectly, can cause adverse environmental consequences. The probable adverse impacts which could result from these impact agents are briefly described in general terms. The sale specific evaluation of these potential impacts is summarized in the Summary Impact Assessment, (Appendix B); the major environmental issues and potentially significant environmental impacts for each alternative are discussed in Section IV.B.

1. Routine Production Activities

a. Discharge of Cleaned Drilling Muds, Cuttings and Produced Formation Waters

As the drill bit bores through bottom sediments and the underlying native rock, it pulverizes these materials and they move up the riser to the surface where they are cleaned and discharged overboard along with a considerable volume of commercial drilling muds. During the course of drilling a 15,000 ft. well, about 110 tons of commercial mud components and 950 tons of drill cuttings are discharged overboard. Drill cuttings are not known to be toxic and their discharge should cause only minor environmental impacts; however, certain components of drilling muds are known to be toxic to certain fresh water organisms. Most of discharged drill cuttings and drilling muds should either settle to the bottom within a small area around the drilling platform or disperse as a plume of turbidity, and the area affected by these discharges should be small.

Petroleum reservoirs often have water associated with the oil and gas (formation water or oil field brines). These waters may be fresh or contain mineral salts such as iron, calcium, sodium, bicarbonates and chloride and oftentimes contain small amounts of oil. Their discharge increases the mineral content and lowers dissolved oxygen levels in the area of operations.

b. Pipeline Burial and Installation of Rigs or Platforms

Present OCS operating regulations require burial of pipeline in water depths of less than 200 feet. Present requirements for granting BLM rights-of-way permits stipulate burial to a depth of 3 feet where the overlying water depth is 200 feet or less. Gathering lines from clustered rigs or proximate fields do not have this requirement, as they are considered part of the production system, and are generally not buried as commercial ship traffic is at a minimum close to rigs. However, because they are small diameter lines they tend to sink into the sediments by themselves. During pipeline burial, a large volume of bottom sediments are disrupted and suspended in the water for a short period of time. In general, the environmental impacts of pipeline burial are very similar to those of discharges of drill cuttings and drilling muds:

— Dredging in nearshore areas will often result in resuspension of many years' accumulation of such materials as organic matter, phosphates, and other nutrients, as well as toxic heavy metals and pesticides.

— On hard bottoms, dredging will eliminate suitable sites for attachment of the biotic communities dependent upon hard substrate attachment (sponges, soft and hard corals, seaweeds, sessile molluscs). This impact will persist throughout the pipeline burial path either permanently or until the substrate gradually becomes recompacted.

— Displaced material can smother the burrowing and attached benthos. This can occur where these materials settle to the bottom and accumulate to significant depths.
— Increased turbidity in all locations where these activities occur. The small sized particles causing this turbidity can clog the respiratory organs of many marine organisms and the filter-feeding mechanisms of numerous others.
— In coastal wetlands, pipeline burial operations could displace many species of wildlife during construction and maintenance operations. The effects of pipeline burial in wetlands can have a substantial impact for a duration of one to several years as a result of devegetation and disruption of substrate. An additional potentially significant impact of pipeline burial in coastal estuaries can result from disruption of the water circulation patterns.
— Emplacement can also cause physical damage to unknown cultural artifacts and sites (e.g., shipwrecks and human habitation sites).

Rig and platform installation and anchoring can have similar environmental impacts to those discussed above, though to a lesser degree, due to the smaller area of the sea bottom disturbed.

c. Physical Presence of Platforms, Boats and Barges

The construction and placement of OCS petroleum drilling and production platforms could cause significant environmental impacts. The physical presence of platforms will affect both commercial fishing and navigation. Petroleum production platforms could adversely affect commercial fishing by removing open waters and seafloor from use by purse seiners and trawlers, and by creating obstructions on the seafloor upon which both purse seiners and trawl nets can foul. The flotsam and jetsam from OCS petroleum operations can also generate adverse impacts on commercial fishing similar to those caused by platforms.

Both platforms and the flotsam and jetsam attendant to OCS petroleum operations can cause adverse aesthetic impacts. Platforms which are visible from shore on clear days could reduce the scenic values of some very valuable real estate. Furthermore, these same platforms may be objectionable to recreational users of public beaches and other coastal zone recreational activities. Requiring subsea completions in such areas is one way of removing this adverse impact on the aesthetic values of the coastal zone.

Petroleum development platforms may also interfere with coastal shipping traffic. Both the increase in ship traffic and the platforms attendant to OCS petroleum production will increase the possibility of collisions between ships and between ships and platforms. The Coast Guard reports that between 1974 and 1977, 15 vessels collided with structures in the Gulf of Mexico. Damages exceeding $100,000 were reported for four of the vessels. Conflicts between platforms and coastal shipping can be mitigated by not allowing platform placement in established coastal shipping lanes.

2. Oil and Gas Spills and Other Accidents

In the complex OCS operations involving heavy equipment, flammable materials, working at sea with many employees, and reliance on complex technology, it is inevitable that accidents will occur. Proper analysis of these accidents is a complex problem. The history of OCS petroleum development accidents provides substantial data base for estimating the frequencies of future accidents.

a. Natural Gas Leaks Associated with Blowouts

Information furnished by the GS for the period 1956 to 1973 lists 38 gas leaks associated with well blowouts during OCS petroleum development operations in the Gulf of Mexico. Eleven of these incidents in the Gulf of Mexico involved fires and five were associated with oil or condensate spills. The duration of these blowouts ranged from two hours to over seven months. No estimates have been made of the amount of gas lost.

b. Oil Spills

Oil spills are recognized as the most common cause of environmental pollution associated with offshore oil and gas activity. All phases of petroleum development from exploration to production have the potential for causing or contributing to oil spills.

Table 6 contains data on the annual number and volume of oil spills for a recent five year period (1971-1975) in the Gulf of Mexico. These statistics indicate the following general spill characteristics (the statistics for this period are believed to be representative of the general character of oil spills over a much longer period of time):

— The vast majority of oil spills are small (99.7 percent were less than 50 barrels and 85 percent were less than 1 barrel).
— Over a period of several years most of the volume of oil spilled is contributed by a few large spills (0.5 percent of the spills accounted for 91 percent of the oil spilled).
— Major oil spills (1,000 barrels and over) are few in number and exhibit a low average number of occurrences per year (however, during the 1971-1975 period, 3 spills occurred in one year and 2 spills occurred in the following year).

Table 7 contains aggregate statistics on annual major oil spill incidents (238 barrels or more) for the 15 year period 1964-1978. These statistics indicate an average annual occurrence of 2 such spills. This average was exceeded 5 times during this period. 6 incidents occurred in 1969, thereby making it the year of highest occurrence. It is interesting to note that 1969 was only the third highest in volume of oil spilled (30,024 barrels), considerably behind the amounts spilled in 1967 (160,637 barrels) and 1970 (83,895 barrels). The median annual volume is represented by 1976 with 4,300 barrels of oil spilled, and the aggregate 15 year spill rate is .0009 percent of the volume produced.

Oil spills resulting from pipeline accidents; oil well blowouts; explosion, fires and severe storms; and tanker and tank barge accidents and operations are discussed in the following paragraphs.

(1) *Pipeline Accidents:* During OCS operations, more oil has been spilled from pipeline accidents than from all other types of OCS petroleum production accidents.

Between 1967-1976 there have been 17 reported pipeline breaks and leaks, with a spillage greater than 50 barrels each, in the Gulf of Mexico. The total volume of oil spilled due to these accidents is approximately 27,000 barrels. This volume amounts to .0009 percent of the total Gulf of Mexico OCS production for the same period.

Since 1970, 73 percent of the total volume of oil spilled by pipelines was the result of ship anchors dragging across the pipeline, causing them to rupture. Other causes of pipeline damage include movement due to wave action during storms, impact of trawl boards of commercial fishing boats, internal corrosion of the line due to formation water that is produced with the oil, and unstable sea bottom conditions.

Starting in 1969, several actions were undertaken to reduce the chances of such accidents and to reduce the volume of these spills. Burial of all new common carrier pipelines, with a minimum cover of three feet (10 feet in shipping fairways and anchorage areas), was required by BLM for rights-of-way permits in water depths of less than 200 feet. In water depths of less than 200 feet, only the lines in the gathering system between adjacent platforms of a particular oil or gas field may remain unburied. Permits to construct these gathering lines are granted by GS and the decision on whether to require burial is made on a case-by-case basis. These administrative actions have substantially reduced the risks of future pipeline ruptures due to anchor dragging.

Additional safeguarding of OCS pipelines and mitigation of accidental spills is provided by regulations promulgated by the Office of Pipeline Safety (OPS) of the Department of Transportation. Petroleum pipelines in offshore areas are required to be coated with tightly banded materials impervious to moisture,

Table 6

Number and Volume of Spills Each Year, 1971-1975
Gulf of Mexico Outer Continental Shelf

Year	SPILLS OF LESS THAN 50 BARRELS				SPILLS OF 50 BARRELS OR MORE 1/					All spills
	Less than 1 bbl	1-14 bbl	15-49 bbl	Total	50-499 bbl	500-999 bbl	1,000-9,999 bbl	10,000 bbl or more	Total	Total
					NUMBER OF SPILLS					
1971	913	321	11	1,245	11	0	0	0	11	1,256
1972	953	202	4	1,159	2	0	0	0	2	1,161
1973	1,005	162	4	1,171	1	0	3	0	4	1,175
1974	1,051	75	3	1,129	6	0	1	1	8	1,137
1975	1,021	100	5	1,126	2	0	0	0	2	1,128
1971-75	4,943	860	27	5,830	22	0	4	1	27	5,857
					TOTAL VOLUME (BARRELS) OF SPILLS					
1971	228	1,008	257	1,493	1,285	0	0	0	1,285	2,778
1972	238	703	91	1,032	150	0	0	0	150	1,182
1973	251	585	85	921	240	0	21,935	0	22,175	23,096
1974	263	329	75	667	675	0	2,213	19,833	22,721	23,388
1975	255	344	112	711	266	0	0	0	266	977
1971-75	1,235	2,964	620	4,824	2,616	0	24,148	19,833	46,597	51,411

1/ Includes seven spills of 50 barrels each: 5 spills in 1971, and 1 spill each in 1972 and 1974.

Source: U.S. Geological Survey, Circular 741 (1976).

Table 7

Major Oil Spill Incidents*
OCS-Gulf of Mexico

Calendar Year	Incidents	Total Oil Spilled (B)	Annual OCS Oil Production (MB)
1964	5	14,928	115
1965	2	2,188	136
1966	0	None	175
1967	1	160,639	206
1968	1	6,000	250
1969	6	30,024	285
1970	3	83,895	312
1971	1	450	359
1972	0	None	356
1973	4	22,175	342
1974	2	22,046	316
1975	1	Unknown	288
1976	2	4,300	281
1977	2	550	250
1978	0	0	255
Total	30	347,195	3,926

Notes: (B) barrels
(MB) million barrels

* Major incidents consist of oil spills of 238 barrels (10,000 gal.) or more. Spills of this size comprise the medium and major pollution incident categories used in the National Contingency Plan.

Source: USGS, 1978.

followed in many cases by a layer of dense concrete for mechanical and corrosion protection. To protect against electrolytic corrosion, impressed currents of sacrificial anodes are required. The OPS regulations requiring protection devices and pressure monitoring systems, coupled with regular inspection of the pipeline route for leaks and other irregularities, should also substantially reduce the risk of pipeline oil spills.

Other features used by industry serve to further mitigate against accidents: continuous metering systems, automatic high pressure shut-downs and remotely contolled mainline block valves that can isolate sections of the line.

Prior to institution of the new pipeline burial requirements, the spillage rate from pipeline accidents was .00624 percent of total production. With the new regulations, this spillage rate has been substantially reduced to .0017 percent of total production in the period since 1970.

(2) *Blowouts:* It is possible for wells to blow out of control during drilling operations, completion and production. Blowouts may be prevented during drilling by increasing mud weight and activating blowout preventers. When a well is completed, a subsurface safety device is installed to prevent the well for blowing out if surface control is lost.

Northern Gulf of Mexico OCS statistics indicate that an average of one blowout occurs for every 245 wells drilled, spilling approximately 1,294 barrels of oil each. Not one pollution incident by blowout, greater than 200 barrels, has occurred since 1971 (USDI, GS, 1976). Most blowouts causing spillage result from producing oil wells, not wells being drilled. Producing oil well blowouts are normally a result of equipment malfunctions, workover procedures, human errors, storms and collisions.

A serious blowout did occur, however, in the southern Gulf of Mexico off the Mexican coast. A Petroleos Mexicanos (Pemex) platform blew-out on June 3, 1979, near the fishing village of Ciudad del Carmen, one of the world's richest shrimping/fishing grounds. Subsequent to the blowout, a mixture of escaping oil and gas ignited, destroying the well and a semi-submersible platform valued at $22 million. No lives were lost. The Pemex disaster has resulted in the release of an unknown quantity of natural gas and an estimated 30,000 bbls of crude oil -- more than 1.2 million gallons -- per day. As of July 9, it became the largest oil spill in history, surpassing the Amoco Cadiz disaster off the coast of France in 1978 which spilled 1.3 million barrels of crude oil. A directional relief well is being drilled to tap into the base of the well and is scheduled for completion in mid-September. By that time it is possible that 3 million bbls of oil will have been released. No official details are as yet available on the cause of the spill. This light crude is forming an emulsion as it is injected under high pressure into the sea at depth. As the mass of oil moves away from the well site it begins to break up into discrete patches. The surface of these patches forms an asphaltic crust which encapsulates the mass and prevents further weathering. Chemical analysis of the leading edge emulsion indicates that it still contains highly toxic components that would normally have evaporated or been otherwise removed. Thus, as the spill begins to make a U.S. landfall, after several months at sea, it is still relatively unweathered and is expected to wash ashore for several months.

(3) *Explosions and Fires:* Fires have always been a major hazard in the petroleum industry. OCS operations are no exception. Geological Survey statistics indicate that most of these fires have been extinguished before serious damage and pollution occurred. Only 5 percent of those accidents surveyed resulted in oil spills; however, the volume spilled in two of these incidents was very large, 30,500 barrels from one and 53,000 for the other. Due to the history of fire-related massive oil spills, OCS orders were amended to require extra safety precautions to reduce the potential for future fire related oil spills. To eliminate blowouts due to malfunctioning velocity-actuated downhole safety devices, OCS Order No. 5 requires surface actuated safety devices. Since 1971, explosion and fire accidents have not resulted in more than minimal oil spills.

(4) *Severe Storms - Hurricanes:* In the history of Federal OCS oil and gas activities, there has been only one severe storm which caused significant oil spillage. On October 3, 1964, a hurricane passed over the waters off central Louisiana destroying three OCS platforms. The total volume of oil spilled in this hurri-

cane was approximately 12,000 barrels. All of this spilled oil was from tanks used to store produced oil prior to trans-shipment by barge.

Since 1964, three major hurricanes hit the extensive offshore petroleum production areas off Louisiana, but they have not resulted in major pollution incidents from operations in Federal waters.

(5) *Ships Colliding with Platforms:* Commercial vessels can collide with OCS platforms, typically causing substantial damage to both the vessel and the platform. Accident records indicate an instance of a significant oil spill from a platform caused by ship collision. In April 1964, a freighter off central Louisiana struck and damaged a platform, resulting in a fire and loss of about 2,500 barrels of oil into the sea. More recently, the GLOBTIK SUN collided with a structure in West Cameron Block 534 with a total loss of both the vessel and the structure and some pollution reported as a result.

(6) *Tanker and Tank Barge Accidents and Operations:* Accidental oil spills from tankers and tank barges, as well as oil discharged during normal operations, are probably the largest source of oil spills in the U.S. Transportation of petroleum in tankers and tank barges is hazardous. Tanker spill rates are higher than the total of all other OCS spill rates. This high oil spill hazard of tanker and tank barge transportation of petroleum is a very important factor in distinguishing the relative oil spill hazards of the various OCS areas. If the OCS petroleum production can be piped to shore, the oil spill hazard is substantially less than the oil spill hazard when tankers and barges are used. Tankering is not expected to result from the proposed lease sale.

c. Accidents Caused by Geologic Hazards

The geologic hazards described in Modification B-4 in Section II.B.4. can cause oil spills and structural failures resulting in extensive property damage, injury and loss of life. Geologic hazards with the greatest potential for causing accidents are unconsolidated gas-saturated delta sediments, faulting and bottom roughness.

Unconsolidated gas-saturated sediments have moved with sufficient force to jeopardize drilling and production platforms, as well as pipelines, and several failures have been reported. One such incident was the loss of a production platform following hurricane Camille where it was concluded that the structure failed primarily because of wave-induced soil movements that caused the foundation elements (pilings) to fail in bending. Furthermore, several pipeline failures in the vicinity of the Mississippi Delta are believed to have been caused by sediment mobility.

Gas escaping from sediments at intermediate and deep depths migrates along fault plains. Where these plains are penetrated by a surface casing a faulty cement job may allow high-pressure gas to migrate upward between the well bore and casing, causing serious problems during drilling operations which could precipitate an accident.

d. Generic Adverse Impacts of Oil Spills

Oil spills have the potential to cause the following impacts: (1) death or impairment to off- and onshore organisms due to water quality degradation; (2) changes in biological habitats; (3) pollution of recreation beaches; and, (4) economic cost of cleanup and loss of business. The degree or severity of these impacts will depend on the chemical properties of the spill material; the magnitude, duration, frequency and location of actual spill occurrences; and ambient environmental and other relevant factors.

Localized degradation of air quality is the primary impact of gas leaks. Extensive property losses, and injury and death of workers, can also result from gas leak accidents.

3. Onshore Facilities and Support Services, Employment and Induced Consequences

This section briefly describes the general onshore requirements for facilities and support services, including their locational, land, employment and other major infrastructural requirements. It also indicates the general types of potential impacts associated with these requirements.

a. Operations Bases and Support Services

One or more onshore operations bases are usually established to support oil and gas activities in a given offshore region. The actual number of operations bases in a given area will depend on several factors: the number and distribution of lease holdings, the number of companies with holdings, the amount of dependent activity and the distance from the onshore base to the leased tracts. In the Gulf of Mexico, distances and land availability have not been important constraints, and operations have evolved over a long period of time. In this region, individual companies commonly have separate operations bases scattered along the Gulf.

Typically, an operations base includes helicopter pads, warehouse space, offices, staging area and dockage, requiring about 50 acres of land. Locational requirements include an inland water docksite with ocean access accommodating drafts to 15 feet in a planned or existing industrial (zoned) area. Necessary infrastructure (water, utilities, highway access, etc.) must be available.

A number of support services (e.g., a mud supplier; cement, logging and perforating, wellhead equipment, trucking, downhole equipment, wireline, diving service, and rental tool companies) will require building space or sites with industrial or commercial zoning (as appropriate), highway access, and in some areas rail access and inland water docksites with ocean access. The total land requirements for these activities is estimated at 25 to 50 acres. Water, utilities and other infrastructure must also be available. The location of these support services is fairly flexible. They need not be located adjacent to the operation base(s) they serve; for example, they may be more likely to locate near to the source of necessary materials. Most of the support services are readily available to existing and potential offshore oil and gas activities in Texas and Louisiana. However, only a few such services are now located in Mississippi, Alabama and the Florida panhandle.

Operations bases and services established to support exploration activities would continue serving offshore operations in development drilling. The operation bases themselves and many of the service companies would also support the production phase. It is important to note that overlap and development occur in any lease sale ; additionally, in a major producing area like the central and western Gulf of Mexico, which has an ongoing and projected OCS oil and gas development program, these activities are likely to overlap from one lease sale to the next.

The employment requirements and characteristics of the exploration and development phases are similar to those of most other industrial development. Exploration and development activities are expected to take place over a 7-9 year period, peaking in the 3rd or 4th year. The total number of persons employed during this period will depend on the number of tracts leased in the sale and the lessee's planned development schedule. These factors will then be used to determine the number of drilling rigs required to meet the development schedule and, in turn, the number of rigs working at any one time throughout the exploration and development phases will determine the labor requirements as well as needs for support company services and other direct and indirect needs/demands.

Operation of a typical exploratory drilling rig requires about 110 workers, and each such rig can drill from 4-6 wells per year. The exploratory phase requires the largest number of non-resident employees because of the skills needed and the temporary nature of the work. Development rigs have similar requirements, however; the crews are smaller -- about 65 workers per rig is typical. Employment needed for the production phase will steadily rise in direct relation to the number of productive wells and platforms brought into service, peaking near the end of the development phase, then leveling off for the duration of

maximum production, and finally beginning to decline as production decreases. Platforms require crews of about 16 workers. With the exception of trained supervisors, the skill requirements are not highly specialized, and in most areas the crew members are hired locally or take up local residence. Total employment during this phase is therefore substantially less than during the exploratory and development phases.

b. Platform Fabrication Yards

Platform fabricating yards require a coastal site with docksite and ocean access. The site for a major new fabrication yard could be as large as 1,000 acres. Highway and rail access are also required as is the availability of essential community infrastructure.

Since there are several active fabricated yards located in Louisiana and Texas with the necessary capacity to handle the projected platform requirements of the proposed lease sale, it is assumed that no additional acreage will be required and that current employment levels and infrastructural demand levels will not be significantly affected.

c. Transportation Facilities

(1) *Terminals:* Terminals are designed to receive, store and discharge crude oil or products by pipeline, truck or railroad; they may be marine, coastal or inland. Offshore crude oil loading terminals are located in safe deepwater areas convenient to the market center, and often require modification of existing harbor facilities. Facilities which may be found in the terminal are: storage tanks, docks, tanker loading and ballast water treatment facilities, power plant and vapor control facilities, an office building, fire pump building and fire station, warehouse and shop building, and oil spill contingency equipment.

The need for and location of new terminal facilities in response to OCS development will depend on location and size of crude reserves, available refinery capacity, availability of onshore sites and availability of existing terminal facilities. If a refining center is relatively close or volume of crude is large enough, the crude may be transported by pipeline to the refinery, and no offshore loading terminals would be indicated. If terminals were to be constructed, they could be either land based crude reception and loading terminals or floating storage terminals.

Oil storage tanks require the greatest amount of land of any element in the transportation system. The amount of land needed depends on the number of tanks needed and how the tanks are constructed. A typical terminal (including storage facilities) will use about 40 acres of land. Since the siting of storage tanks is flexible because their function is not site specific, they can be sited along a corridor where they would be least obstructive and present the least conflict with other land use, as well as where potential environmental effects would be minimized. A non-urban location is desirable, and highway and rail access are required.

(2) *Pipelines:* A primary consideration in determining a pipeline right-of-way is to get the oil or gas from the producing area to its destination (refinery, gas processing plant, or oil terminal facility) by the most economical method. Since offshore pipelines are usually more expensive, the shortest marine route to land is generally most desirable. There are significant constraints on utilizing the most direct corridor: topography, environmental values, and regulatory and jurisdictional consideration. Federal regulatory procedures must be followed. States have jurisdiction within the three mile limit over marine pipeline right-of-way, and onshore States and/or localities have control over placement of pipelines.

Pipelaying barges may employ about 170 workers, about a third of which are unskilled and will be recruited locally, if available. Like workers on drilling rigs, most of the skilled pipelaying workers migrate with the vessel from job to job. As a rule of thumb, the normal rate of pipelaying progress is considered to be a mile a day. The duration of construction will also depend on the number of miles of pipe to be laid, and bottom and weather conditions.

Proper planning can help minimize adverse land use and environmental effects caused by construction or existence of onshore pipelines. The kind of impact which pipelines cause will depend on the type of area they traverse. Buried onshore pipelines would generally not affect land use except to preclude certain uses within the right-of-way. Existing transportation corridors would be used to the maximum extent possible. Since onshore pipeline location is controlled by state and/or local jurisdictions, much of the burden for controlling and planning for onshore pipeline corridors will fall to these jurisdictions.

d. Processing Impacts

(1) *Oil Refineries:* In an oil producing area like the Gulf of Mexico , the location of any new refineries will be strongly influenced by the location of existing refinery capacity and transportation facilities as well as the availability of suitable sites, potential pipeline corridors, state and local land use and environmental regulations, and infrastructural requirements. Most refineries are located along the coast or near water bodies to minimize transportation costs and to have large volumes of water available for processing. About 1,200 acres is generally regarded as the minimum requirement for a new refinery site (this amount of acreage allows for expansion and a buffer zone).

During construction, refineries employ the largest labor force of any OCS development activity. Construction of a typical 200,000 BPD refinery would take about 3 years and employ an average of 1,800 workers, of which 1,000 would be skilled labor. The effect of temporary employment of this magnitude on a nonmetropolitan area could be great.

Analysis of current oil refinery capacity in the Gulf of Mexico OCS region indicates that any additional oil resulting from the proposed lease sale will not induce more new capacity, in the aggregate, than would otherwise occur.

(2) *Gas Processing:* Gas processing plants are tied to the productive life of a field (or fields, if more than a single field is connected by pipeline to the facility). These facilities do not require a coastal site. The most important locational factors in siting a gas processing plant are proximity to the market, the source of production and the distribution system. Sites selected for these facilities must be consistent with the requirements of State and local land use plans and zoning, coastal zone regulations, and air and water quality standards.

A gas processing plant with a capacity of 300 mmcf/day requires 20 to 75 acres, and only about 21 employees. Construction would take place over a 2 year period and employ about 300 workers.

In established major producing areas like the Gulf of Mexico where gas processing plants are already extensively developed, it is expected that further OCS production would replenish depleted supplies, thereby increasing existing capacity utilization. It may also cause an expansion of existing facilities in addition to possible construction of new plants, depending on the magnitude of future discoveries. For this lease sale, however, it is estimated that expansion of existing capacity will not be required.

e. General Social and Economic Consequences

The general economic and social consequences and potential adverse impacts typical of oil and gas exploration, development, production and processing are quite similar to those resulting from most other types of industrial development. Briefly, new industrial development in an area results in short and long-term increases in employment and economic activity, increased demand for public and private services and increased residuals or wastes from production and consumption. These changes can stress an area's resource base, creating temporary and long lasting problems such as labor and housing shortages, traffic congestion, lower quality of police and fire protection, crowded classrooms and degradation in air and water quality. The potential severity of the impact is related on the one hand to the type, magnitude and timing of the new development and on the other hand to the capacity of the local area to accommodate the change.

Local area capacity is largely determined by the size and character of the existing stock of natural and socio-economic resources; e.g., existing OCS and other oil and gas infrastructure; current levels of employment, income, public and private community services; the availability of land suitable for urban development; the sensitivity of local air and water resources to additional development pressures; and the area's financial, planning and management (local government) resources. In the following paragraphs the potential consequences of OCS development on the economic and social activities of a local area are briefly discussed.

(1) *Employment:* OCS development will generate direct, indirect and induced employment. During the exploratory and development phases employment will rise and fall in direct relation to the amount of drilling and construction activity. Longer term employment will result if wells are brought into production, but will be much smaller than that generated during the drilling operations. These temporary and longer term employment increases could be beneficial to a local area or region by decreasing unemployment and underemployment.

(2) *Population:* Regional and local population will increase in relation to the number of new employees who move into the area. The number of new resident employees, and hence the increase in area population, can vary widely from place to place and from time to time. The total population added to an area also depends on the number of new resident employees who have families, and the size of these families.

(3) *Business Activity:* Local and regional activity should benefit from OCS-generated increases in purchases of industrial and commercial goods and services. Personal consumption of goods and services will increase in relation to the amount of new resident population and income.

(4) *Property Values:* Sites used for OCS onshore activities (e.g., operations bases, support services, refineries, gas processing plants and terminal and storage facilities) will probably increase in value. Nearby properties might decrease in value, particularly residential, because of actual or perceived nuisance or environmental conflict. Conversely, in some instances the price of nearby properties might appreciate due to speculation on its potential for being rezoned industrial or commercial. Areas with adequate community planning and land use controls should be able to minimize the occurrence of conflicts which might result in environmental degradation and decreased property values.

(5) *Community Services and Facilities (Infrastructure):* Increases in local and regional population and business activity will cause corresponding increases in the demand for public and private community services and facilities such as education, potable water supply, energy services, police and fire protection, transportation, recreation, sanitary sewage and solid waste disposal and housing. Such population and business activity fluctuations could cause temporary deficiencies in service levels (e.g., fewer and less frequent services, crowding and congestion, increased cost, shortages in supply) and thus adversely affect the quality of life and even the physical well-being of the population at times. The severity of these potential deficiencies will be directly proportional to the total increase in demand and the length of time over which the increase occurs, and inversely proportional to the capacity of existing services systems and facilities to provide for increased demands without lowering design service standards to the point where the quality of service is considered unacceptable by the public.

(6) *Public Fiscal Balance:* Increases in local and regional business activity, population, property values, income and housing generated by OCS development will cause an increase in public revenues. At the same time, expenditures for public services and facilities will rise in response to increased demand engendered by the OCS generated economic and population growth. In some instances increased demand for public services may call for expenditures in excess of current revenues, thus calling for an increase in taxes or other revenue public producing measures, or most often, a temporary lowering of service levels and quality.

B. Environmental Impacts of the Proposal and Alternatives

The following environmental impacts were determined after scoping and coordination meetings were held. An analytical assessment was subsequently made of the impacts which could occur if the sale were held, or if any of the other alternatives occurred. Appendix B is the result of that assessment and indicates the degree of significance involved and the methodology used in that determination. Eight issues were chosen as being significant enough to address. They are detailed below as they relate to each alternative.

1. Alternative "A" -- Hold the Sale as Proposed

The area proposed for this sale covers the Gulf of Mexico as indicated on figure 1. For a complete discussion of this area, see section I.E.1.

a. Impact on Multiple Use Area

The Destin Dome Area in the Gulf of Mexico, due to locational and natural characteristics, is an area of many present and potential uses. A conflict has arisen between the Department of Defense (DOD) and DOI over their respective uses. DOD has listed most of it as a military warning area and uses it as a missile range site, as well as conducting other military operations there. Simultaneously, within the area there exists the Destin Dome anticline, a site which is believed to have potential for oil and gas operations. It is this area about which no agreement has been reached between DOI and DOD to consider tracts for proposed lease sales.

In the original tentative tract list developed for Sale 62, no tracts in the Destin Dome Area were included. At the request of BLM's Washington Office, however, a revised tentative tract list was resubmitted to them which included 37 tracts in the Destin Dome Area (A62-185 through A62-221). These tracts are located on the crest and western flank of the Destin anticline.

Subsequently, a request for "Comments and Indication of Interest" was published in the March 13, 1979 Federal Register. Interest by industry was extremely low; nevertheless, in consideration of national interests and the energy shortage, they were retained in the final tract list for the sale.

Because of this potential user conflict, a special study is being undertaken by DOD concerning their own present uses and its effects on future leasing activities which may occur as a result of this sale. Based upon the findings of this study a determination will be made whether or not to retain tracts A62-185 through A62-221.

Conclusion

Unless agreement is reached between DOI and DOD to allow leasing of these tracts, they will be deleted from the sale.

b. Impact on Employment

The issue addressed here is whether the proposed sale will have a beneficial or negative impact on local/regional employment and related socioeconomic areas of concern.

Since there are no specific or detailed exploration and development plans at this preliminary stage in the proposed lease sale process, the assessment of environmental consequences and impacts was based on resource estimates supplied by the U.S. Geological Survey and the development assumptions outlined in Section I. It is important to know that these resource estimates and development assumptions are not a prediction of the actual amount, location and related effects of the proposed lease sale. Rather, they provide a representative scenario (i.e., framework of assumptions) of possible development for use in assessing potential impacts if the scenario were actually to occur.

A substantial total amount of direct employment will result from the proposed lease sale (table 8). Short-term employment during the exploration and development phase is estimated to average 859 over the 1982-1989 period, and reach a peak of 1,419 in 1984 The production phase is expected to generate longer term employment which increases to a maximum of 352 in 1988, remains at that level for about 6 years, and then begins a gradual decline as the number of producing wells and platforms decreases. The development scenario assumes that about 50 percent of the direct employment will be based in Louisiana, 45 percent in Texas and 5 percent in Florida.

Based on these direct employment and locational assumptions, estimates were made of the total employment which would be generated by the proposed lease sale (table 9). These estimates were made with the use of extrapolations from an earlier analysis of similar onshore impacts which utilized the multiregional, industrial forecasting model developed by Dr. Curtis B. Harris, Jr., of the University of Maryland. Total employment generated by the lease sale will increase rapidly over the first 5 or 6 years, reaching a maximum of 4,412 in 1987, and thereafter commencing a sharp decline until about 1992 when a more gradual decrease begins. Almost 60 percent of the total emploument impact will be felt in Texas, and 36 percent will be located in Louisiana.

The local and regional impact of the employment generated by the proposed lease sale will be beneficial because it provides additional job opportunities which could have the effect of reducing actual and potential unemployment levels. That is, these job opportunities could help sustain current employment levels by offsetting an existing declining trend; or they could completely offset such a trend and create new job opportunities which could then be filled, at least in part, from the ranks of the unemployed; or they could augment an existing growth situation with additional job opportunities and even more rapidly reduce the unemployment level. The degree of benefit will depend on the actual and relative amount by which potential and/or existing unemployment levels are reduced.

The employment and resultant job opportunities which will be generated by the proposed lease sale could in turn, depending on local/regional employment trends and unemployment levels, generate new resident employment (i.e., employees who do not currently reside in the affected study site in question). New resident employment determines the amount of new population, which in turn will result in increased demands for housing, educational and other public and private services. Given the fact that most of the assumed locations of onshore employment activity in Louisiana and Texas have a well established oil/gas service and facilities infrastructure and an experienced labor force, it could be assumed that the existing labor force in these areas could fulfill most of the employment requirements of the proposed lease sale. However, the percentage of new resident employment in each locality has been deliberately assumed at a somewhat higher percentage than these factors would indicate so that a higher degree of impact could be assessed. The resulting new resident employment and new population for the impact areas in Texas, Louisiana and Florida are shown in table 10. Within Louisiana, the St. Mary/Terrebonne/Plaquemines parishes area would be most heavily impacted. From 1981-1987, 446 new resident jobs and an additional resident population of 1,028 persons would be generated. The Houston metropolitan area (Harris/Galveston/Chambers/Brazoria counties) would experience the largest increases in new resident employment and population (780 jobs and 1,797 persons). These figures, as well as those for the other impact areas, represent only a small fraction of the base level employment and population. For instance, the estimated new resident population in the St. Mary/Terrebonne/ Plaquemines parishes area amounts to only 0.58 percent of the 1979 estimated population of the area.

Potential adverse impacts can result when new resident employment and the attendant increase in population exert a significant increased demand for public services (e.g., education, water supply, sewage treatment, solid waste disposal, police and fire protection), housing and other community infrastructure over a short period of time. Such demands can temporarily exceed a localities capacity to supply additional services, particularly if the increase is concentrated in a relatively small area and amounts to a significant rate of annual increase. The potential impact will probably be exacerbated in areas where there are existing shortages and inadequate public service levels. For the purposes of this assessment it is expected

Table 8

Estimated Direct Employment
Generated by this Proposed Lease Sale

	Exploration/ Development	Development	Platform	Pipeline	Onshore	Total
1982	374	0	0			374
1983	748	330	44	11		1133
1984	1122	330	88	11		1507
1985	748	330	132	11		1177
1986	748	495	198	11		1221
1987		660	264	11	18	953
1988		660	352	22	18	1052
1989		495	352	22	18	887
1990			352	11	18	381
1991			352		18	370
1992			352		18	370
1993			352		18	282
1994			264		18	282
1995			264		18	282

Table 9

Estimated Total Employment
Generated by this Proposed Lease Sale

	Total (Cumulative)				Annual Increase	
Impact Area	1982	1984	1987[a]	1992	1981-1984	1981-1987
Louisiana Parishes	261	1496	1592	342	748	265
Texas Counties	232	2441	2599	1015	1221	433
Florida Counties	26	207	221	71	104	37
Alabama Counties	b	b	b	b	b	b
Mississippi Counties	b	b	b	b	b	b
Total[c]	519	4144	4412	1357	2072	735

a. This is considered the peak year indicating the maximum additional employment generated by the proposed lease sale, 1981-1987.
b. Less than 10. Neither of these states is considered further as an impact area.
c. Not including Alabama and Mississippi.

Table 10

Estimated Maximum New Resident Employment and Population
Generated by this Proposed Lease Sale
1981-1987 (Peak Year)

Impact Area	New Resident Employment		New Resident Population		Total Increase in New Resident Population as a Percentage of the Est. 1979 Population
	Total Increase	Annual Increase	Total Increase	Annual Increase	
Louisiana Parishes	637	106	1468	245	0.11
(St. Mary/Terrebonne/ Plaquemines)	(446)	(74)	(1028)	(171)	(0.58)
(Jefferson/Orleans)	(127)	(21)	(294)	(49)	(0.03)
(Lafourche/Iberia/ Vermilion/Cameron)	(64)	(11)	(147)	(25)	(0.07)
Texas Counties	1040	173	2396	399	0.07
(Jefferson)	(104)	(17)	(240)	(40)	(0.10)
(Harris/Galveston/ Chambers/Brazoria)	(780)	(180)	(1797)	(299)	(0.07)
(Nueces/Aransas)	(104)	(17)	(240)	(40)	(0.09)
(Willary/Cameron)	(52)	(9)	(120)	(20)	(0.05)
Florida Counties	88	15	202	34	0.06
(Bay/Escambia)	(88)	(15)	(202)	(34)	(0.06)
Total	1765	294	4066	678	0.08

that by the time the new population impact is beginning to be felt the affected localities would have programs and actions underway to alleviate most existing inadequacies and provide for expected future demand/impact. Use of the Coastal Energy Impact Program (CEIP) is assumed. This program was specifically established to assist states and communities in the planning and financing of facilities and services needed to avoid or alleviate potential adverse effects of coastal energy developments.

The estimated demands generated by the new resident employment and population for housing and educational services are listed in table 11. The estimated increased demands in all areas are small (both the total and annual amounts) and represent a very small portion of existing supply or base level. In addition, the average annual rate of increase and resultant impact appears to be insignificant in all cases. Additional comments on the expected impact of the proposed lease sale on employment, population, housing, local business activity, local fiscal balance, land use conflicts and competition, and community infrastructure are included in the Summary Impact Assessment, Appendix B.

Conclusion

The proposed lease sale will generate a considerable amount of employment (job opportunities) which could have a beneficial impact, particularly at the local level, by reducing the potential level of unemployment.

The new resident population induced by this employment will result in vary small increases in the demand for housing, educational and other public services. It is expected that these demands will be met without significantly lowering existing service levels or standards (this should be the case even in localities where service levels may be considered inadequate). At worse, the proposed lease sale could result in, or contribute to, a minor short-term impact on the quality of a public service (e.g., education) in a particular area. No significant short or long-term adverse impacts are expected as a direct result of the proposed lease sale.

c. Impact on Air Quality

The OCS Lands Act Amendments explicitly directs the Secretary of the Interior to control air pollution from OCS oil/gas activities which may significantly affect the air quality of coastal states. U.S. Geological Survey is developing regulations which address the problem of potential offshore air quality degradation as a result of OCS oil/gas activities. Also, studies are being funded to prepare emissions source identification and inventory for representative OCS oil/gas operations, to determine the current onshore air quality through compilation of existing data and to evaluate pertinent meteorological conditions for transport of emissions.

The Texas coastal region has a potential for the occurrence of air quality problems. The city of Houston and the concentration of industries along the Houston Ship Channel are two critical air quality locations and this situation is aggravated by the high relative humidity prevalent in that area. In addition, the Beaumont-Port Arthur-Orange area and Corpus Christi area experience some air pollution problems.

Air quality over most of coastal Louisiana is better than ambient air quality standards in all but the Baton Rouge area near the petrochemical complexes north of the city. At Lafayette, Lake Charles and New Orleans, only suspended particulates consistently exceed ambient standards.

In Mississippi, Harrison County has an air quality problem related to bituminous coal combustion, and in Alabama, Mobile County experiences air pollution which is related to industrial fuel combustion.

The air quality of Florida is good; however, the counties with major urban areas may have high pollution concentrations.

Degradation of offshore air quality will occur in cases of oil spills, oil and gas blowouts, pipeline breaks, oil storage, gas venting and the normal exhaust of platform generators and service vessels.

Approximately 70 percent of the total non-methane hydrocarbons (29,403 mg/yr) emitted offshore is caused by oil storage on production platforms (136×10^3 mg/yr) and from venting (93×10^3 mg/yr).

Table 11

Estimated Additional Demand for Housing and Educational Services
Generated by this Proposed Lease Sale
1981-1987

Impact Area	Required Housing Units		New Students	
	Total	Per Year	Total	Per Year
Louisiana Parishes	510	85	311	52
(St. Mary/Terrebonne/ Plaquemines)	(357)	(59)	(218)	(36)
(Jefferson/Orleans)	(102)	(17)	(63)	(11)
(Lafourche/Iberia) Vermilion/Cameron)	(51)	(9)	(31)	(5)
Texas Counties	832	139	526	88
(Jefferson)	(83)	(14)	(53)	(9)
(Harris/Galveston/ Chambers/Brazoria)	(624)	(104)	(395)	(66)
(Nueces/Aransas)	(83)	(14)	(53)	(9)
(Willary/Cameron)	(42)	(7)	(26)	(4)
Florida Counties	70	12	36	6
(Bay/Escambia)	(70)	(12)	(36)	(6)
Total	1412	235	837	146

Power generation during production activities is the largest source of continuous emissions of nitrogen oxides (NO_x), sulfur oxides (SO_x), hydrocarbons (HC), carbon monoxide (CO) and particulates. Gas venting is required during drilling as a result of drilling fluid degassing. During production, major waste gas sources include pressure-relief valves, compression by-pass loops and oil storage tanks. This gas venting is approximately 90 percent methane with trace amounts of other hydrocarbons and carbon monoxide.

The total uncontrolled emissions from offshore facilities in the Gulf of Mexico (both Federal/State waters) have been estimated in mg/yr as follows:

NO_x	SO_2	HC	CO	Particulates
43,083	2,101	237,893	11,643	1,439

Since production in the Gulf of Mexico has been declining, activities resulting from this proposed sale will tend to replace existing activities; therefore, no substantial additions to these total figures are expected.

All onshore operations which will result from this proposal will be required to meet all Federal, state and local air quality standards. The onshore activities will be subject to all permit requirements and will be required to comply in full with all onshore operating conditions, including, where necessary, offsets. The major factors that could result in onshore air quality degradation are increased population and transportation, and construction of roads, refineries, gas processing plants and terminal/storage facilities.

According to the development assumptions for this proposal (Section I.E.2.) there could be a terminal/storage facility constructed in the vicinity of Corpus Christi, TX; Caillou Lake, LA; and/or Navarre, FL. The effects on present air quality conditions in these areas would be a slight/inmeasurable increase in air pollution emissions, considering the present levels in these areas (U.S. EPA, 1977c).

Conclusion

Air quality will not be severely degraded as a result of this proposed sale. The largest amount of emissions offshore would result from oil and gas well blowouts. These emissions will be fairly dispersed and should not affect onshore areas. The major onshore emissions would result from possible terminal/storage facilities and may cause slight localized air quality degradation in the vicinity of these facilities.

Any effect on air quality as a result of this proposed sale would be negligible; since the production in the Gulf of Mexico has been declining, no cumulative effect on overall air quality is expected.

d. Impact on Water Quality

The major source of waste water generated by offshore facilities is produced waters, the major constituents of which are oil and grease, residual chlorine and floating solids.

Drilling muds and drill cuttings may be discharged if they are water based and their discharge does not result in free oil on the surface waters. Muds and cuttings that are oil based may not be discharged. Presently a drilling mud report is required when applying for a Plan and Development Permit from USGS; this covers both water based and oil based muds. The requirement for this can be found in OCS Order No. 7. The Environmental Protection Agency has proposed effluent limitations which would apply to the discharge of formation waters and are broken down into 3 basic categories: the best practicable control technology currently available (BPCTCA), the best available technology economically achievable (BATEA) and new source performance standards (NSPA). The BPCTCA and BATEA regulations apply to existing sources and take effect in July 1977 and 1983, respectively. The proposed NSPS are identical to the

BATEA regulations and are applicable to new sources, the construction of which is commenced after the promulgation of the regulations. These have been developed for two categories of installations: the "near offshore" which is within 3 miles of the coastal basin and the "far offshore" which is beyond 3 miles of the coastal baseline. For the near offshore category BPCTCA is an average of 48 mg/l for oil and grease in produced water and BATEA calls for no discharge to surface waters. For the far offshore category, BPCTCA is also 48 mg/l but BATEA is 30 mg/l average discharge of oil and grease in produced water.

Bottom sediments would be put in suspension during exploration and development by emplacement of blowout preventors, drilling platforms, sea-bottom equipment, pipeline burial and disposal of drilling fluids and cuttings. Pollutants that are entrapped in the bottom sediments would be dispersed into the water column. A turbidity plume may be created. The life and size of this plume would depend upon the size, shape and density of the suspended material, and the turbulence of the water.

The disposal of drilling fluids and cuttings also results in a turbidity plume. It is estimated that in drilling to 10,000 feet approximately 995 tons of drilling muds and 511 yds^3 of cuttings are disposed overboard during 20 days of drilling. The largest turbidity plume observed in the Gulf of Mexico resulting from drilling operations was 65 ft. wide and more than 1 mile long.

While no definite conclusions have been drawn on the manner in which drilling mud chemicals and drilling cuttings may contribute to pollution in the marine environment, research in this area is currently in progress. Possible pollutant characteristics include: acute toxicity to fish; high immediate dissolved oxygen demand; and high concentrations of organic carbon, total nitrogen, phosphorous solids, chemical oxygen demand and chromium.

The production and discharge of formation waters (oil field brines) was discussed earlier. Three components or properties of formation waters contribute to water quality degradation when released into the Gulf. These include: entrained liquid hydrocarbons, dissolved mineral salts, absence of dissolved oxygen and radionuclides.

Due to the many factors which contribute to the physical and chemical characteristics of formation waters, no reliable estimate can be made to the extent of the impact from these waters. The characteristics of formation water can change during the oil production period as more reservoirs are tapped or if accidental leakage occurs between reservoirs; however, based on acute toxicity, formation water in general has been shown to be relatively innocuous. Based on research results available to date, the disposal of treated formation water would not be expected to cause significant water quality degradation on the OCS.

Water quality could be further degraded as the result of accidental oil spills. Part of this spilled oil would probably be dispersed into the waters of the Gulf where it would be reduced further by microbial degradation and weathering.

Radionuclides have been detected in produced formation waters in activity levels ranging from 4 to over 1,000 picoCuries per liter. Ambient radioactivity levels in continental shelf waters are approximately 1-2 picoCuries per liter. The constituent of greatest concern is radium which has been measured in produced waters from several Gulf of Mexico wells in concentrations exceeding 300 picoCuries per liter (Ra^{226} and Ra^{228}).

The potential effects of the radionuclides which will be disposed of in produced formation waters is difficult to assess because little is known concerning concentrations. Even though marine life has been subjected to small doses of ionizing radiation from natural sources over geological periods of time, the effect of radionuclides from produced formation waters cannot be totally discounted since ionizations produced by such radiation bring about changes in the atomic structure of cellular materials and may result in observable biological effects. Radiation tolerance generally decreases with increasing complexity of biological organization, but increases from immature to mature life forms for a given species. Therefore, immature vertebrates, such as larval fish could be susceptible to this potential danger.

It is estimated that a maximum of three terminal/storage facilities may be constructed onshore as a result of this proposed sale. These facilities could have a slight impact on the water quality in the vicinity. The amount of effluent discharged and the area in which the facility is constructed is a major factor in

determining the extent of the impact. These facilities would come under State jurisdiction in regard to effluent discharge. The Water Quality Management Plans (P.L. 92-500) for each respective state provide a baseline for the present water quality for each basin. Depending on the location of the terminal facilities, mathematical models would be calculated for the particular basin and the water quality of the area could be determined. Since these facilities are located onshore, the regulatory power to provide sufficient waste water discharge is regulated by State Water Quality Boards under EPA guidelines.

In summary, the turbidity that results from the discharge of drilling fluids and cuttings is localized and its duration is short. Thus, there would be no severe water quality degradation problems resulting from turbidity.

Oil spills present a more serious problem. Yet even in the case of spills the diluting effect of the large volumes of Gulf waters and the microbial degradation of the hydrocarbons will act to reduce the deleterious effects over time. The seriousness of the effects on water quality will depend on the amount of oil spilled and the depth of the water; in shallow waters the oil may become entrapped in the sediments to be released later when the sediments are resuspended during storms. Unfortunately, none of these effects can be quantified, partly due to our lack of precise knowledge of the fates and effects of oil on the environment, and partly because so much depends on the particular circumstances of a spill.

Conclusion

While short-term effects in the vicinity of operations have been observed in a few cases, no significant water quality degradation in the Gulf of Mexico resulting from OCS oil and gas operations has been observed.

e. Impact on Fisheries Resources

OCS oil and gas activities introduce various stresses to fishery organisms. Basically, two types of effects can be expected to occur: lethal and sublethal effects. Lethal effects are those which cause immediate mortality. Lethal effects can be caused by toxicants or from smothering and suffocation. Sublethal effects are those which do not cause immediate mortality, although death may follow at some later date. These effects may be acute, that is a single sudden stress, or chronic, stresses recurring frequently over extended time periods.

Historically, studies have dealt with impacts at the organisms level, rather than higher levels of biological organization such as populations and communities. The latter subjects are much more difficult to study and consequently there is little information available in the literature. This is unfortunate, since the analysis of impacts on fisheries requires information concerning effects on populations. The United Nations (UN) group working on effects of oil in the marine environment found that it is difficult to predict effects from laboratory tests of acute toxicity because of the simplicity of laboratory systems compared to the complexity of natural marine systems. Further, they found that the laboratory measurements can provide exaggerated effects (IMCO/FAO et. al. 1977).

The manifestation of impacts on fishery resources is alterations in stock abundance and species composition. The causes of the above effects can take two pathways, primary effects and secondary effects. Primary effects are those which affect the organisms comprising the fishery directly, without intermediate steps. Discharges of drilling fluids, physical damage of structure emplacement and oil spills are examples of primary effects. Secondary effects are those which impact other components of the ecosystem or interfere with ecological relationships, the end result of which is an altered fishery stock. Examples of secondary effects are habitat alterations, destruction of critical components of trophic structure, bioaccumulation, bioconcentration, and biomagnification. Typically, the impact of secondary effects surface at some later time.

The UN group working on oil pollution found that, "Although bioconcentration has been shown to occur, the process of biomagnification remains only a theoretical possibility. There is no convincing evi-

dence at this time for the food chain biomagnification of petroleum hydrocarbons. The bioconcentration of petroleum hydrocarbons that has been observed in organisms of higher trophic levels is more likely a function of the ability of these species to concentrate hydrocarbons from the water, than a function of their position in the food web." (IMCO/FAO, 1977 p. 41).

The fisheries resources in the northwestern Gulf of Mexico have been subject to petroleum development with its concomitant chronic and acute stresses for over 30 years. At present, the existing data bases cannot support a detailed analysis of the catches, landings and species composition over the years; however, some suitable data bases should become available through the Fishery Management Plans being developed under the auspices of the Gulf of Mexico Fishery Management Council.

The fisheries of the Gulf of Mexico are dominated by estuarine associated species, and estuaries and coastal areas are more sensitive to oil spills and oil-related perturbations than the open ocean. Therefore it should follow that, if major adverse impacts have occurred over the years, it should have affected those fisheries. Presently, we have no evidence indicating any lasting impact on these estuarine — associated fisheries.

The commercial and recreational fishing industry may be adversely affected by closure of areas or condemnation of catches. In the Gulf of Mexico, we have no record of this occurring.

There has been concern expressed that components of crude oil, polynuclear aromatic hydrocarbons (PNAH), induce carcinomas in marine organisms and that ingestion of these cancerous tissues presents a significant health hazard to humans. The UN group found no evidence linking carcinogens present in oil and carcinomas in marine organisms or the presence in seafood and cancer in man (IMCO/FAO, 1977). This is further reinforced by the lack of evidence of biomagnification.

Conflict between fishing gear, trawls, and the oil and gas industry is discussed in FEIS 58, Volume I, pp. III 39-41 (USDI, BLM, 1978b). Provisions for compensation of losses is contained in Title IV Fishermen's Contingency Fund of the OCSLAA, 1978. The National Oceanic and Atmospheric Administration is responsible for administering this fund.

Conclusion

There is no evidence to indicate that oil/gas operations in the Gulf of Mexico as a result of this proposal will adversely affect fisheries resources.

f. Impact on Endangered Species

About 22 endangered/threatened species occur in the northern Gulf of Mexico coastal region. Therefore, formal consultations under Section 7 of the Endangered and Threatened Species Act were initiated with the Fish and Wildlife Service and National Marine Fisheries Service pertaining to OCS oil/gas activities in the Gulf of Mexico region. In the biological opinions of these agencies, this proposal, subject to boat traffic restrictions in Florida coastal waters will not jeopardize the continued existence of the endangered or threatened species considered in these consultations, or result in destruction or modification of critical habitats, or habitats likely to be determined as critical in the future. The biological opinions of these agencies are in Appendix E.

However, there is a possibility of a moderate, localized impact to discrete populations of brown pelicans in the southeastern Louisiana coastal area and marine turtles in the northwestern Florida coastal area as a result of nearshore oil spills coming into coastal waters and/or onto beaches (Visual No. 3). Also, pipeline and/or onshore facility construction could impact marine turtle habitat in the northwestern Florida area.

Assuming a 25 year production life for tracts in this proposal, and assuming a 25% probability for the occurrence of one oil spill greater than 1,000 bbls, there would be about a 10% probability of an oil spill impacting brown pelican and/or marine turtle habitats within 10 days (USDI, BLM, 1978a, FEIS 65, Volume 1, Appendix H).

For this proposed sale one pipeline from the offshore Destin Dome tracts to a landfall in the vicinity of Navarre, Florida and one onshore terminal/storage facility in this same area have been assumed. If these facilities were constructed, there could be a moderate risk to marine turtles and/or their habitat as a result of pipeline construction through offshore turtle feeding areas and/or onshore turtle nesting beaches. Also onshore terminal/storage facility construction could disturb turtle nesting beaches and/or facility lighting could disorient hatchling turtles as they leave the nesting beach.

Conclusion

There is no historical evidence of a measurable impact to endangered/threatened species from OCS oil/gas activities in the Gulf of Mexico region. However, there is a possibility of a moderate localized impact to discrete populations of brown pelicans in the southeastern Louisiana coastal area and marine turtles in the northwestern Florida coastal area, from oil spills and/or construction activities as a result of this proposal.

g. Impact on Shoreline Recreational Resources

A quick glance at visual 4 (Eastern and Western Gulf) shows the concentration of developed and natural recreational resources associated with the coastal zone in relation to the sale tracts. Coastal beaches, barrier islands, parks, wildlife refuges and management areas, aquatic preserves, wilderness areas, natural landmarks and scenic rivers are many of the places people visit to relax, swim, snorkel, boat, play games, observe nature, seek solitude, fish, hunt, camp, picnic and enjoy, in general, water-oriented and water-enhanced recreational activities. These shoreline recreational resources and consequently the people who enjoy them and are economically dependent on them may incur impacts directly from offshore oil and gas developments, product transportation systems, onshore support facility developments and other activities relating to or resulting from primary offshore oil and gas exploration and development.

Approximately 80 percent (1,100 miles) of the 1,400 miles of Gulf shoreline between Brownsville, Texas and Cape San Blas, Florida is beach shoreline (Corps of Engineers, 1971). Of this beach shoreline an estimated 300 miles are frequently utilized recreational shorefronts, most notably two national seashores, several state and county beach parks and beaches associated with coastal communities. The beach-water interface is the most critical recreational environment; therefore, recreational activities associated with Gulf front beaches are most susceptible to impacts from offshore oil and gas development, especially that which could contribute persistent pollutants to the marine environment.

With reference to the 296 lease tracts being studied in this proposal, GS has estimated up to 30 production platforms could be placed somewhere on this acreage and 450 miles of pipeline may be required to accommodate potential production and transportation of up to 50 million barrels of oil and one trillion cubic feet of gas. Existing supply bases, staging areas, fabrication and refining facilities onshore are considered adequate to handle expected offshore support and product processing needs resulting from this proposal. Up to three new pipeline landfalls and storage facilities could feasibly be required as a result of this proposal.

The most feared adverse impact to shore based recreation which can result from offshore petroleum exploration and development is oil pollution. Oil spills can originate from drill site blowouts and accidents, offshore and nearshore pipeline breaks and transport vessel accidents, or a non-dramatic combination of all these causes often called chronic pollution. Crude oil or its residue that finds its way onto shoreline resources will impact recreation areas and, consequently, recreation use. Should a pollution incident retard recreation use, then tourism and, ultimately, local economies could be affected. Experience has shown, however, that acute oil spills from offshore lease tracts rarely have direct and dramatic impacts on shoreline recreational resources.

From 1971 to 1975 over 2.5 billion barrels of oil and condensate were produced from the OCS in the central Gulf of Mexico with the total spillage recorded amounting to 51,421 barrels. This spillage

resulted from 5,857 incidents; however, 5 major spills accounted for approximately 84 percent of the total volume of spilled oil recorded. A single spill resulting from a pipeline break contributed almost 20,000 barrels to the marine environment (U.S.D.I. GS., 1975). None of these incidents, either individually or in combination, caused a mass oiling of a Gulf front beach or resulted in a beach or park closure.

Freefloating hydrocarbon residues, also known as "tar balls", have been affecting Gulf of Mexico beaches since the beginning of human habitation in the Gulf coastal region. Tar balls have been a nuisance to beach users for many years and contribute to the maintenance requirements of beach adminstrators from Texas to Florida. The problem has chronically affected recreational enjoyment of south Texas beaches. Investigators have estimated offshore drilling contributes only 2 percent to ocean hydrocarbon pollution (National Academy of Sciences, 1973). Ocean transportation and industrial and urban sources are major contributors with natural subsea seepage and atmospheric fallout also adding to marine hydrocarbon pollution. Dr. Lela Jeffrey (Texas A & M) has studied beach tars for over seven years and determined from analysis of over 300 samples that over half are derived from crude oils. She is of the opinion, however, that this crude is primarily from sources other than production on the U.S. outer continental shelf in the Gulf of Mexico. South Louisiana crude oil is characterized as light, sweet crude, low in asphaltene and sulphur content--the chemical and physical properties conducive to tar ball formation.

Trash improperly disposed of offshore, or debris from accidents offshore, can eventually impact the aesthetics of shoreline recreation resources and cause increased maintenance problems to resource area administrators. Although a minor problem, such impacts can be expected.

Pipeline landfalls can cause temporary removal of shoreline recreational land from public use. Up to three landfalls could result from this proposal and it can be assumed that two of these landfalls may directly impact recreational beaches. Section I.E.3. describes development and transportation assumptions which include pipeline landfalls in the southwest Texas and northwest Florida vicinities. Each of these potential landfall areas is characterized by long stretches of barrier islands and dedicated National Seashore lands. Conceivably, approximately 200 feet of National Seashore or barrier island beach property at 2 locations could be breached as a result of this proposal. This would cause the removal of approximately 400 feet of beachfront from recreational use for about two weeks or the duration of the landfall construction activity.

Conclusion

This proposal is likely to cause minor, intermittent pollution and debris wash-up on shoreline recreational resources throughout the Gulf of Mexico, affecting the aesthetic quality of some shoreline beaches which will contribute to the routine maintenance problems of shorefront beach and park administrators. This predictable impact to shoreline resources will be a nuisance to some beach users but is unlikely to affect the level of use. Additionally, pipeline landfalls in Texas and Florida could temporarily preclude recreational use of approximately 400 feet of Gulf front beach. Continued and expanded leasing in the Gulf of Mexico is supporting the industrialization of the South and indirectly contributing to the coastal population migration phenomena. More people with more disposable income are impacting existing park and recreational facilities in the coastal zone and are increasing demands for additional recreational access to waterfront or shoreline beach sites.

h. Impact on Recreational Fishing

The major recreational activity which commonly extends out into the areas of the proposed lease tracts is recreational fishing. Some SCUBA diving also takes place offshore, especially in the central Gulf where underwater visibility in the nearshore marine environment is poor. Experience has shown, especially in the central Gulf off Louisiana, that oil and gas development offshore significantly enhances deep sea recreational fishing and scuba diving. Major semi-permanent installations such as easy to locate, multi-

well platforms placed in proposed lease tracts would attract and concentrate sport fish and inevitably sport fishermen (Colunga and Stone, 1974). The degree to which offshore oil and gas development will affect recreational fishing is believed to be related to the number and size of structures erected, the length of time they are in place and the distance they are from shore and principal access areas. Water depth, oceanic condition and bottom types around an offshore platform might also affect fishing.

Up to 30 permanent production life platforms are expected to result from a proposed lease sale in the Gulf of Mexico offering approximately 300 tracts. Every one of these structures will attract fish and potentially fishermen. Within a few weeks of placing a platform in offshore waters exceptional harvest of sport fish have been made. Production platforms may remain in place from 10-30 years with drilling activity occurring in only a few of those years. Generally, the longer an offshore structure remains on location, the more likely it will become a known and utilized sport fishing location.

Many avid anglers, especially those seeking big game trophies, venture more than 50 miles offshore in search of fishing waters. Casual fishermen, however, are more inclined to stay within sight of the shoreline. Tracts leased and developed in the 3-20 mile-from-shore range are, therefore, most likely to attract the most fishermen (Ditton and Graefe, 1978). Not only sport fishermen but marine fishing support industries such as marinas, lodging establishments, boat manufacturers and dealers, and sporting goods stores will benefit from increased interest in deep sea fishing stimulated by platform or artificial reef developments (Aska, 1978; Crozier, 1977; and Bearden, Burrell & Cupka, 1978).

Conclusion

This proposal should enhance recreational fishing offshore in the Gulf of Mexico within leased tracts which are ultimately developed, especially those within 20 miles of shore. Continued and increasing petroleum leasing and development activity in the Gulf has resulted in the establishment of approximately 2,500 offshore structures. These structures have had a profound effect on the patterns of offshore Gulf recreational fishermen.

i. Unavoidable Adverse Environmental Effects

As discussed in IV.B.1.a.-h., certain OCS oil/gas activities may cause adverse effects which would be considered unavoidable if this proposal proceeds.

Effects on Multiple Use Areas: OCS oil/gas activities in the military warning area within the Destin Dome tracts could slightly interfere with military operations within the warning area. However, the Department of Defense stipulation should mitigate these conflicts.

Effects on Air Quality: Air quality could be slightly/immeasurably degraded as a result of this proposal. The major potential for offshore air pollution emissions would result from oil/gas well blowouts. Severe air quality degradation could result in the vicinity of a blowout. The major potential for onshore air pollution emissions would result from terminal/storage facilities emissions. A slight addition to air pollution emissions would occur in the vicinity of these onshore facilities.

Effects on Water Quality: Water quality will be slightly degraded in the vicinity of drilling sites by turbidity resulting from the discharge of drill cuttings/muds and the discharge of formation water from producing wells. Also, turbidity resulting from pipeline burial and onshore facility construction will cause localized and short-term degradation of water quality.

Effects on Fisheries Resources: Fisheries resources may be slightly damaged by oil spills in localized areas depressing local fishing resources.

Effects on Endangered Species: Endangered wildlife may be slightly affected by nearshore oil spills by direct contact and/or contamination of food/habitat. Also, coastal construction could disrupt wildlife habitat in localized areas.

Effects on Shoreline Recreation: Shoreline recreation could be slightly depressed by an oil spill and/or facility construction in the coastal zone. The incremental effect of this proposal, considering past oil/gas activities, will be of minor localized effect.

j. Irreversible and Irretrievable Commitment of Resources

Present production of the estimated mean average 27.1 million barrels of oil and 735 billion cubic feet of gas for this sale precludes their use by future generations and, if alternative energy sources do not replace them, an irreversible loss of mineral resources occurs.

Deaths and permanent disabilities from OCS activity accidents are an irretrievable loss of human resources. Between 1970 and 1977, there have been 131 deaths and 197 injuries from such activities. Although they cannot be eliminated, deaths and injuries are minimized by continuous updating of OCS safety standards.

k. Relationship Between Short-term Uses of Man's Environment and Maintenance and Enhancement of Long-term Productivity

As discussed previously in this section, the oil/gas operations as a result of this proposal will have a moderate, localized and short-term effect on some of the living resources of the Gulf of Mexico OCS region. Some plants and animals will be killed, and some habitat will be eliminated. Overall, the long-term effects on the biota are considered to be minimal. If all oil/gas operations were terminated, within 1-3 years the biological communities would probably return to pre-drilling levels and compositions.

The induced development may result in short-term adverse impacts to communities. A strain on existing infrastructure would be expected if new sale-related facilities are located in areas of low population with little current industrial base. In the long-term, however, adjustments can be expected as population gains and induced industrial development are absorbed in the expanded communities. Land utilized for facilities directly associated with OCS operations will be excluded from other uses over the 25-year life of the field; however, only a portion of this land may continue to be so utilized after production ceases.

The major consideration between short-term use and long-term productivity involves the oil and gas resources and the effects of such resources on economic conditions such as employment, production of other products and use as fuel.

2. Alternative "B" -- Modify the Proposal Via Tract Deletions

Alternative B involves reducing the scope of Alternative A (Hold the Sale as Proposed) by one or any combination of 6 proposed deletion modifications. The least reduction in scope (5 tracts) would result from modification B-1, while the maximum reduction in scope (120 tracts) would be attained by all 6 modifications. A detailed discussion of the reasons for each modification is found in section II.B.

In the discussion that follows, emphasis is placed on the extent to which each modification could change the environmental effects of Alternative A on the identified issues and concerns.

a. Modification B-1: Delete 5 Tracts Involved in Legal Controversy

(1) Description

These 5 tracts (A62-71 through A62-75) are located south of Marsh Island, Louisiana in an area extending for about 20 nmi along the shoreline and ranging between 14 and 17 nmi offshore (see visual 1 and Tract Overlay).

The tracts are considered oil and gas prone, and are estimated to contain about 5 percent of the total oil resources and about 2 percent of the total gas reserves of Alternative A.

The modification is estimated to reduce the oil and gas development activities assumed for Alternative A by the following amounts: 2-8 wells and related drilling muds and cuttings, and formation waters; 1-2 platforms; 2-8 miles of new pipeline; and the employment associated with the reduction in exploration, development and production activity.

(2) Environmental Consequences

Modification B-1 will result in all the environmental effects discussed for Alternative A except as follows:

(a) *Employment:* A slight decrease (possibly 2 percent) in employment could result from the estimated reduction in exploration, development and production activity. Thus, the potential benefits of Alternative A (e.g., increased job opportunities and the possible reduction in unemployment) would not be wholly realized.

(b) *Community Infrastructure:* The somewhat negative localized and short-term effects which could result from inclusion of the 5 tracts would be precluded. In any case, these effects are not expected to be significant.

(c) *Air and Water Quality:* The somewhat negative localized and short-term effects which could result from inclusion of the 5 tracts would be precluded. In any case, these effects are not expected to be significant.

(d) *Recreational Fishing:* A very slight (1-2 platforms) reduction in recreational fishing opportunities would occur.

(e) The modification would also preclude any environmental effects which would have resulted from well drilling, rig and platform installation, pipeline laying and production activity.

Conclusion

Modification B-1 will result in an action with environmental effects which are not expected to be significantly different from those of Alternative A. This modification will preclude the domestic production of about 0.8-2.5 million barrels of oil and 0.01-0.05 trillion cubic feet of gas estimated for Alternative A. The loss of this production represents a lost opportunity to lessen our dependence on foreign oil importation.

b. Modification B-2: Delete 37 Tracts in Destin Dome Multiple Use Area Which Also Have Potential for Live Bottom

(1) Description

These 37 tracts (A62-185 through A62-221) are located about 28 to 43 nmi south of Destin, Florida in water depths ranging between 60 to 140 meters (see visual 1 and Tract Overlay). The tracts are estimated to be oil prone and contain about 39 percent of the total oil reserves of Alternative A.

The tracts are located in a Department of Defense (DOD) Military Warning Area encompassing the Destin Dome anticline which is believed to have potential for oil/gas development. The proposal to lease these tracts has introduced a multiple use conflict between the Department of the Interior (DOI) and DOD.

Currently, no agreement has been made between the Departments pertaining to the conflict of military usage versus oil/gas development as a national priority.

This modification is estimated to reduce the oil/gas development activities assumed for Alternative A by the following amounts: the drilling of 15-56 wells and related drilling muds and cuttings, and formation waters; the installation of 3-4 platforms, 12-56 miles of pipeline, and one terminal/storage facility; and the siting of one pipeline landfall.

(2) Environmental Consequences

Modification B-2 will result in all the environmental effects discussed for Alternative A except as follows:

(a) *Multiple Use Area:* Deletion of these tracts from Alternative A would remove the potential multiple use conflict of the Destin Dome tracts.

(b) *Employment:* There would be a moderate (about 12 percent) reduction in direct employment resulting from this modification, as these 37 tracts represent about 12.5 percent of the oil/gas development estimated for Alternative A.

(c) *Community Infrastructure:* As a result of the removal of proposed oil/gas development from this area, there would be no increased pressure on community infrastructure.

(d) *Air and Water Quality:* As no onshore or offshore oil/gas development would occur in this area, as a result of this modification, there would be no additional air or water pollution.

(e) *Endangered Species:* Deletion of this group of tracts would remove the risk of potential impact on marine turtles and their habitat along the northwest Florida coast.

(f) *Shoreline Recreational Resources:* As a result of this modification, there will not be any adverse impacts on shorelines from oil spills or pipelines.

(g) *Recreational Fishing:* As no offshore platforms will be constructed, the potential enhancement of recreational fishing will be lost.

(h) The modification would also preclude any environmental effects which would have resulted from well drilling, rig and platform installation, pipeline laying and production activity.

Conclusion

Modification B-2 would preclude any environmental effects on nearby biological areas which could result from exploration, development and production activities/facilities in the deleted tracts. It would remove the multiple use conflict and the risk of potential impacts to endangered marine turtles from Alternative A. This modification would preclude the domestic production of about 6-19 million barrels of oil estimated for Alternative A.

c. Modification B-3: Delete 10 Tracts in Areas Requiring Biological Protection

(1) Description

These 10 tracts (A62-53 through A62-57, A62-62, A62-104, A62-135, A62-136 and 62-69) are located between 21 and 99 nmi off the Texas and Louisiana coasts at 5 separate locations which are on or near biologically sensitive areas (topographic highs) rising out of deep water near the continental shelf break (see visual 1 and Tract Overlay).

Eight of the tracts are considered gas prone and 2 are considered oil and gas prone. The tracts are estimated to contain about 4 percent of the total oil reserves and about 2 percent of the total gas reserves estimated for Alternative A.

The modification is estimated to reduce the oil and gas development activities assumed for Alternative A by the following amounts: 4-15 wells and related drilling muds and cuttings, and formation waters; 1-2 platforms; 3-20 miles of new pipeline; and the employment associated with the reduction in exploration, development and production activity.

(2) Environmental Consequences

Modification B-3 will result in all the environmental effects discussed for Alternative A except as follows:

(a) *Employment:* A slight decrease in employment would result from the estimated reduction in exploration, development and production activity. Thus, the potential benefits of Alternative A (e.g., increased job opportunities and the possible reduction of the number of unemployed) would not be wholly realized.

(b) *Community Infrastructure:* Potential localized, short-term minor adverse impacts which could result from inclusion of the 10 tracts would be precluded.

(c) *Air and Water Quality:* Potential localized, short-term minor adverse impacts which could result from inclusion of the 10 tracts would be precluded.

(d) *Recreational Fishing:* A very slight (1 to 2 platforms) reduction in recreational fishing opportunities (destinations) expected from Alternative A would occur.

(e) The modification would also preclude any environmental effects which would have resulted from well drilling, rig and platform installation, pipeline laying and production activity.

Conclusion

Modification B-3 would preclude any environmental effects on nearby biologically sensitive area which could result from exploration, development and production activities/facilities in the deleted tracts. However, the modification will result in an action with environmental effects which are not expected to be significantly different from those of Alternative A. This modification would preclude the domestic production of about 0.3-1.0 million barrels of oil and 0.02-0.04 trillion cubic feet of gas estimated for Alternative A. The loss of this production represents a lost opportunity to lessen our dependence on foreign oil importation.

d. Modification B-4: Delete 6 Tracts Due to Geologic and Engineering Hazards

(1) Description

These six tracts are located in the Mississippi delta, an area known to contain unstable bottom sediments which can be hazardous to oil and gas exploration and development activities. They are only 3-11 nmi from shore in water depths 40-220 m and are estimated to contain about 4 percent oil and 2 percent gas of the total oil and gas reserves of Alternative A.

This modification is estimated to reduce the oil/gas development activities assumed for Alternative A by the following amounts: the drilling of 2-9 exploratory and delineation wells; installation of 1-2 platforms; 2-9 miles of pipeline; typical amounts of discharged drilling muds and cuttings and formation waters into the Gulf waters.

(2) Environmental Consequences

All of the effects listed under Alternative A will occur except as follows:

(a) *Accidents:* The risk of accidents, and possibly deaths, due to the geological instability of the area involved will be eliminated.

(b) *Employment:* There would be no impact or a slight (2 percent) reduction in direct employment resulting from this modification with no expected impact on community infrastructure because of the few number of tracts involved.

(c) *Recreational Fishing:* As no offshore platforms will be constructed, the potential enhancement of recreational fishing will be lost.

(d) The modification would also preclude any environmental effects which would have resulted from well drilling, rig and platform installation, pipeline laying and production activity.

Conclusion

The environmental effects associated with this modification are very slight for employment and recreational fishing because of the few number of tracts involved. This deletion option will not significantly alter the environmental consequences for Alternative A. This modification would preclude the domestic production of about 0.7-2.1 million barrels of oil and 1.0-2.4 trillion cubic feet of gas estimated for Alternative A. The loss of this production represents a lost opportunity to lessen our dependence on foreign oil importation.

e. Modification B-5: Delete 24 Tracts Located on the Continental Slope

(1) Description

EPA and others have expressed concern over the adequacy of deepwater technology and regulations. For these reasons, these 24 tracts, located in deepwater areas, have been included as potential tract deletions.

These tracts are located in deepwater areas of the continental slope in three areas of the Gulf of Mexico at depths ranging between 140-700 m. The Corpus Christi and Green Canyon tracts (19) are gas prone and the five in Viosca Knoll are both oil and gas prone. This represents 0.7-2.1 million barrels of oil and 0.04-0.1 trillion cubic feet of gas of the total reserves of Alternative A.

The modification is estimated to reduce the oil and gas development activities assumed for Alternative A by the following amounts: 9-36 wells and related drilling muds and cuttings, and formation waters; 1-3 platforms; 8-60 miles of pipelines; and the employment associated with the reduction in exploration, development and production activity.

(2) Environmental Consequences

Modification B-5 will result in all of the environmental effects discussed for Alternative A except as follows:

(a) *Employment:* A minor decrease (possibly 8 percent) in employment could occur because of the deletion of industry-related activities in the development of leased tracts. (See the above description for estimated statistics.)

(b) *Community Infrastructure:* It is not anticipated that a significant impact will occur at the onshore sites associated with these tracts since there already exists a complex infrastructure in the Gulf of Mexico.

(c) *Air and Water Quality:* Two pipeline landfalls have been assumed for the Corpus Christi and Green Canyon tracts. Elimination of these tracts would preclude any degradation which may have occurred.

(d) *Recreational Fishing:* A very slight (1-3 platforms) reduction in recreational fishing opportunities would occur.

(e) The modification would also preclude any enviromental effects which would have resulted from well drilling, rig and platform installation, pipeline laying and production activity.

Conclusion

Deletion of these tracts will not significantly affect the environmental consequences of Alternative A. The modification would preclude the domestic production of 0.7-2.1 million barrels of oil and 0.04-0.1 trillion cubic feet of gas estimated for Alternative A. The loss of this production represents a lost opportunity to lessen our dependence on foreign oil importation.

f. Modification B-6: Delete 43 Tracts in a Special Coordination Area (Buffer Zone)

(1) Description

These 43 tracts (A62-3, 4, 8, 38, 39, 97-101, 123-126, 131, 137-141, 148-155; and 62-6, 8, 14, 15-27, 36, 37, 39-41, 48, 50 and 51) are located about 3-32 nmi from the Louisiana and Texas coastlines in water depths ranging between 4-68 meters (see visual 1 and Tract Overlay). Twenty-four of the tracts are estimated to be gas prone and 19 are estimated to be oil and gas prone. These tracts are estimated to contain about 17 percent of the gas reserves and 20 percent of the oil reserves estimated for Alternative A.

These tracts are located adjacent to coastal state boundaries and the Outer Continental Shelf Lands Act Amendments (OCSLAA) require special coordination with the Governors of these adjacent states relative to the disposition of revenues which may be generated by a Federal lease within such an area.

This modification is estimated to reduce the oil/gas development activities assumed for Alternative A by the following amounts: the drilling of 17-65 wells and related drillings muds and cuttings, and formation waters; the installation of 4-5 platforms, 14-65 miles of pipeline and one terminal/storage facility; and the siting of one pipeline landfall.

(2) Environmental Consequences

Modification B-6 will result in all the environmental effects discussed for Alternative A except as follows:

(a) *Employment:* There would be a moderate (about 14 percent) reduction in direct employment resulting from this modification, as these 43 tracts represent about 14.5 percent of the oil/gas development estimated for Alternative A.

(b) *Air and Water Quality:* As no offshore or onshore oil/gas development would occur in these tracts as a result of this modification (a reduction of 17-65 wells, 14-65 miles of pipeline and one terminal) there would be a moderate reduction in air and water quality degradation discussed in Alternative A.

(c) *Endangered Species:* Deletion of this group of tracts would remove the risk of potential oil spill impacts on endangered brown pelicans and their habitat in southeastern Louisiana.

(d) *Shoreline Recreational Resources:* Deleting these nearshore tracts from Alternative A would moderately reduce the potential risk of oil spills impacting shoreline recreational resources. Also, it would remove the need for a pipeline landfall and storage terminal.

(e) *Recreational Fishing:* Approximately 4-5 offshore platforms would not be constructed as a result of this modification. This would slightly reduce the enhancement of recreational fishing in these areas.

(f) The modification would also preclude any environmental effects to the area's ecosystem which could result from well drilling, rig and platform installation, pipeline laying and production activity.

Conclusion

Modification B-6 would preclude any environmental effects on nearby biological areas which could result from exploration, development and production activities/facilities in the deleted tracts. Air and water quality degradation would be moderately reduced. The risk of potential impacts to endangered brown pelicans and their habitats would be removed from Alternative A. This modification would preclude the domestic production of about 3.3-9.8 million barrels of oil and 0.07-0.18 trillion cubic feet of gas estimated for Alternative A. The loss of this production represents a lost opportunity to lessen our dependence on foreign oil importation.

3. Alternative "C" -- Delay the Sale

a. Description

The alternative of delaying this proposed sale should be considered within the overall framework of ongoing OCS oil/gas development in the Gulf of Mexico region which has a complex infrastructure of OCS-related industries, both large and small. This proposal is but a portion of past and future oil/gas development in this region which began about 25 years ago. Delaying this proposal for an indefinite period (between 1 to 2 years) could produce both positive and negative impacts of a short-term nature.

b. Environmental Consequences

The positive aspects of delaying this proposed sale could be one or more of the following: (1) allow for the development of improved recovery techniques and technology and safer oil and gas operations, thus providing more resource recovery with reduced risk to the environment; (2) resolution of possible inter/intra Federal and/or State concerns; and (3) provide time for the completion of ongoing/proposed environmental studies. (For a discussion and presentation of studies, refer to section I.D. and visuals 12 and 12 E.)

The negative aspects of delaying this proposed sale could be one or a combination of the following: (1) considering the present decline in oil and gas production in the Gulf of Mexico and the continuing demand for oil, replacement oil would require importation. Tankering of oil imports increases the risk of large (greater than 1,000 bbls) oil spills as compared to pipeline transport of OCS production (see section IV.A.1. for a discussion of oil spills); (2) to delay the proposal would increase the overall administrative and energy costs as a result of inflation; and (3) delaying the proposal to some future date could cause a potential loss or decrease in employment and business income with ultimate loss in personal income, government revenues and services to the community.

Historically, when a sale is delayed, no extension date has been given by which companies can plan or reschedule their business activities. Many small industries were developed to provide ancillary services and supplies for OCS production activities in parallel association with the business activities of larger oil companies who have used the DOI 5-year schedule of sales as their own planning tool for business activities and investments. These smaller companies provide services and equipment, such as barges, drilling muds and bits, fluids, helicopters, pipelines, welding supplies, crew boats, etc. Many are subcontracted by the larger companies for their daily operations. Anything necessary to the ultimate production of mineral resources must be provided by these companies. Visuals 7 and 7E lists the infrastructure of businesses associated with oil and gas operations. Delaying the sale for a period of 1-2 years could adversely affect their on-going operations and place a strain on their ability to maintain their business viability during the delay period. These small businesses, not the major oil companies, will suffer the greatest impact from a delay.

It is difficult to assess this loss because of the multiplicity of factors involved. In the area of employment, for instance, it might be more economically feasible for industry to retain some trained employees for a minimum delay period since there is overlapping sales production ongoing in the Gulf. Nevertheless,

it is just as feasible that employment may be lost because of a non-specific delay period and that is the point being addressed now. The working base of men and capital for a large company is much more flexible than for a smaller company which is dependent on sale specific actions. A large company can transfer their trained personnel to their other OCS production areas. Both companies have invested heavily in pre-nomination of tract activities, such as seismic data gathering, and the smaller company may not be able to withstand a loss of revenue returns on money which is nonproductive due to a delay for an extended period of time.

Conclusion

The major environmental impact of delaying this proposed sale is a potential loss of employment, business income, government revenues and community services that would result from Alternative A (Hold the Sale). This would especially affect the smaller busniesses which support OCS operations, and adversely affect their viability if the delay were for an extended period of time. Also, if the potential production of this proposed sale is replaced by imported oil there is a greater risk of large oil spills from tankering than from pipelining (see section IV.B.4., Cancel the Sale, for additional data).

4. Alternative "D" -- Cancel the Sale

a. Description

Although no sale has been cancelled in the Gulf of Mexico in over a decade, it is addressed as an option to Alternative A (Hold the Sale) in view of the fact other sale areas have had cancellations or have legal actions pending which could ultimately result in cancellations. A cancellation should be viewed in context with the overall framework on ongoing OCS development over a 25 year period in the Gulf of Mexico.

b. Environmental Consequences

This alternative also has both positive and negative aspects. In fact, the positive aspects are the same as delaying a sale; differences occur in some of the negative ones.

Additional time is gained to allow for the completion of environmental studies. This time could also be used for research into improved technologies to achieve greater resource recovery. It has been estimated that a mean potential of 27.1 millions barrels of oil will not be produced if a cancellation occurs. (This is equivalent to 3.3 days of imported foreign oil, at an approximate rate of 7.9 million barrels per day.) This lack of production necessitates the substitution of U.S. oil and gas with foreign oil. Tankering is the usual method of transporting the oil, but with tankering there is a higher risk of a major oil spill occurring due to accidents and the large volume of oil being tankered. All oil spills have other associated impacts which must also be considered. See section IV.A.1. for a full discussion on oil spill impacts.

Cancellation also has economic considerations. A potential mean average dollar investment of $1.5 billion in OCS-related activities would be lost to the region. This represents losses to investors, employers and employees, restraint on the local economic growth rate, and reduction of government revenues which in turn reduces services rendered to the communities. The same basic economic problems outlined in Alternative C are relative to canceling the sale. The major exception is that no extension of time is involved and no investment is being held in abeyance. For the small companies, which historically have been the greater proportion of companies involved, their time, money and manpower may be irretrievably lost. This could be a significant impact.

Recreation is likewise affected both positively and negatively. When fuel supplies are insufficient to meet individual expectations and demands of the American public, as was demonstrated during the 1973 and 1979 energy crisis periods, tourism and energy-dependent recreational activities are adversely affected.

On the positive side, insufficient supplies also generate support for research and development into energy alternatives and conservation which could enhance our recreational habits.

The cancellation of this sale would lessen domestic energy development in the Gulf of Mexico and would eliminate not only the mean potential average of 27.1 million barrels of oil previously discussed, but also 735 billion cubic feet of gas, or a total of 9.1×10^{14} Btu's. To supplement this energy loss, potential energy sources must be further developed. See the following discussion on alternative energy sources.

Conclusion

The major environmental impacts of canceling the proposed sale are loss of employment, income and government revenues and communities services that would have resulted from Alternative A (Hold the Sale). Foreign oil would have to be imported and could possibly cause a major oil spill due to tankering. Also, energy-dependent recreation could be affected due to insufficient fuel supplies upon which those activities depend.

c. Alternative Energy Sources

The following eight energy sources are analyzed as potential alternative energy sources should the sale be canceled: (1) importing foreign oil, (2) holding the sale in another OCS area, (3) domestic coal, (4) hydroelectric, (5) nuclear, (6) geothermal, (7) solar/biomass generation and (8) conservation.

1. Importing foreign oil is probably the most likely possibility in replacing the energy loss if the sale is not held. Howard T. Odum (Odum, et al., 1976) estimates that the yield ratio for Near Eastern oil is 5.7 or 5.7 barrels of oil in exchange for one barrel's worth of energy, in terms of U.S. goods. This compares with a yield ratio of 6 for domestic offshore oil. In order to replace the net energy equivalent of the mean oil and gas resource estimates for this sale, 129 million barrels of Near Eastern oil would have to be imported.

Since importing oil (except from Canada or Mexico) would involve tankering, with an oil tanker spillage rate of 0.013 percent (see Alternative A), energy replacement by importing foreign crude could result in about 16,770 barrels of oil spillage. With a pipeline spillage rate of 0.007 percent, the potential spills from pipelining the oil would be 1,897 barrels. Therefore, importing the oil needed to replace the energy lost by canceling the sale could result in 14,873 additional barrels of oil spillage. In addition, Near Eastern oil has an average sulfur content of 1.92 percent while domestic offshore oil has a sulfur content of .61 percent. Therefore, importing oil with high sulfur content, increases potential air pollution emissions of SO_x.

Importing oil to replace the petroleum reserves lost by not holding the sale is an unacceptable alternative for energy independence for the United States. Importing the oil would worsen an already poor balance of trade situation. Additionally, dependence on foreign oil is placing unwanted pressure on American foreign policy (Schnider, 1978).

An argument for importing oil would be encouraging the use of foreign oil to preserve U.S. reserves. This would enable the U.S. to have available oil and gas reserves after the exhaustion of foreign reserves, rather than exhausting American reserves with complete dependency on foreign oil. The United States government, however, has established a policy of encouraging development and production of domestic reserves in order to lessen dependence in the short term until alternative energy sources are available.

2. Holding the sale in another OCS area as a substitute is a possible alternative, but the usual situation is to substitute Gulf of Mexico sales for proposed sales which have been canceled in other OCS areas.

Political and environmental opposition to oil and gas leasing is higher in the other OCS areas than it is in the Gulf of Mexico. The U.S. government has declared a policy of shifting OCS production into other

areas; however, none of the other OCS leasing areas has had the amount of offshore leasing and production experience that the Gulf of Mexico has developed over the past 25 years. It is this experience that results in less environmental and political opposition in the Gulf. Also, since 25 years of offshore activitiy has not shown major environmental impacts in the Gulf, apparently environmental risk from oil/gas activities in the Gulf of Mexico is less than risks in other OCS areas. Another problem is that, to date, drilling operations in other OCS areas has not produced reserves near the magnitude of the Gulf of Mexico.

3. Domestic coal production has been put forth as a major U.S. energy source. The money and resources that would be used to develop the petroleum reserves expected from this proposed sale could be shifted into domestic coal production and potentially satisfy the need for domestic energy production.

There are potential environmental impacts to air quality and to disturbed land areas where stripmining has occurred in some parts of the country. When the production of coal in the western United States is by stripmining, reclamation of the land can be very difficult due to lack of rainfall; however, in other parts of the country reclamation of the land has been much more succssful. In some cases, erosion and degradation of the land remains; in other cases grasses, shrubs and fish implantation have occurred as a result of natural forces. When stripmining occurs on Federal lands, an EIS must be written and mitigation efforts indicated. Both stripmining and reclamation have been the subjects of much legislation and are being dealt with at the Federal and state levels.

Using conversion factors of 5.8×10^6 Btu's per barrel of oil, 1.025×10^6 Btu's per Mcf of natural gas and 26×10^6 Btu's per short ton of bituminous coal, from "Energy Perspectives 2" by the Department of the Interior, 35 million short tons of bituminous coal would have to be mined in order to replace the energy lost in not holding the proposed sale. If this coal were stripmined, 4,070 surface acres would be disturbed (using an estimate of 4.47 acres per 10^{12} Btu's, Hittman, 1974, p. III-7).

Underground mining for coal runs into the problem of health hazards. Using an estimate (Hittman, 1974, p. III-6) of 1.25×10^{-2} death, 5.76×10^{-1} injuries and 31.1 man days lost per 10^{12} Btu's of coal, underground mining to replace the energy lost from this sale can be expected to result in 11 deaths, 509 injuries and 28,513 man-days lost due to accidents. Comparable figures for offshore petroleum are 8.2×10^{-5} deaths, 3.75×10^{-3} injuries and 1.28×10^{-1} man-days lost per 10^{12} Btu's of offshore production. using the mean reserve estimate for proposed Sale 62, .07 deaths, 3.4 injuries and 116 man-days lost in production can be expected from resource extraction.

Burning coal has a potentially higher environmental risk than using offshore oil. The national average sulfur content of coal is 2.59 percent while the average for offshore oil is .61 percent (Hittman, 1974, p. III-1 and IV-3).

On the positive side, energy efficiency for western coal (with a 1,000 mile transport) is 10.6 units of energy gained for 1 unit expended while a similar ratio for offshore Gulf oil is 6 to 1 (Odum, 1976).

4. Hydroelectric power generation in the United States remains an energy source with great undeveloped potential. In the contiguous United States, 46 percent is undeveloped while Alaska and Hawaii have 96 percent of their potential undeveloped. Unfortunately, all the sites near major population centers have been developed and the undeveloped sites are quite remote from end users of electricity (USDI, 1976).

Depending on its location, the development of hydroelectric power by building reservoirs sometimes disrupts an ecological system. When a reservoir is constructed in low lying regions, problems arise because many acres are inundated. When it is placed at higher levels, the flooding is greatly minimized. A major problem is an 8-10 year construction period which is prohibitive compared to 3-5 years for OCS development and production. A major problem is a lead time of eight to twelve years for construction of hydroelectric plants versus three to five years for offshore Gulf wells (USDI, 1976).

The major positive aspect of hydroelectric power is the efficiency ratio of 10.6 to 1 units of energy gained to units expended (Odum, 1976). However, it is unlikely that hydroelectric power would rapidly be developed as a replacement for proposed Sale 62.

5. Nuclear power was originally promoted as potentially inexpensive, environmentally clean, and a safe, powerful energy source for the future. Unfortunately, experience has not proved this true.

Recent rises in uranium oxide prices ($6 per lb. in 1970 to $42 per lb. in 1977 (Commodity Year Book, 1978)), delays in permitting, and longer construction periods have increased both sunk and operating costs to the point where a nuclear power plant has to operate at near capacity for several years just to break even (USDI, 1976, p. 140). In addition, nuclear plants must be decommissioned after 30-40 years due to radiation build-up in the working areas.

In comparing kilowatt hour costs between coal and nuclear power plants, nuclear power plants cost less per kilowatt hour if operated at greater than 55 percent capacity (USDI, 1976). However, efficiency studies (Comey, 1974) have shown that nuclear plants, on the average, operate at only 55 percent capacity.

From an environmental standpoint, the largest pollution problem lies in safeguarding and disposing of nuclear wastes. At the present time there is no common solution to sealing radioactive isotopes having half-lives of thousands of years. In the event of an incident, environmental loss can be very high. Additionally, a reactor accident, such as a core meltdown or widespread radiation, could devastate a large area for thousands of years.

Nuclear plants also release high amounts of thermal pollution. This heat must be dissipated in air or water with resulting disruptions of the surrounding ecosystems. In fact, the difficulties in handling the enormous amounts of heat generated in nuclear plants is the major problem in nuclear plant efficiency. Large amounts of energy in the form of construction, controls and pumping of cooling liquids must be invested in order to extract energy for end use. This lack of efficiency is the primary cause of the 2.7 to 1 net energy ratio for nuclear power (Odum and Odum, 1976). Combined with the mounting public opposition to nuclear plant construction, all these factors make it unlikely that nuclear power will replace the energy lost from canceling the proposed sale.

6. The geopressured aquifers that extend along the northern Gulf of Mexico are a large, perhaps the largest potential source of geothermal energy and natural gas in the United States (see visual 8, "Geopressured-Geothermal Energy in Reservoir Fluids"). Because of the high cost of completing wells into these formations and their relatively low temperatures (200 to 400^{o}F), the utilization of the geothermal energy will be highly dependent on, and of secondary importance to, the value of the entrained methane.

The economics of extracting either the geothermal energy or natural gas from these aquifers does not look promising. The combined requirements of high well flow rates (40,000 bbl/day), long life (20 years), and the necessity of close well spacing to minimize the cost of the collection system may be incompatible with the actual characteristics of the reservoirs. These factors place such stringent requirements on the reservoir size, permeability, an compressibility, or specific storage coefficient, that the number of promising production areas may be severely limited.

7. Solar energy can be utilized in many forms: direct conversion to electricity, temperature gradient electric generation, wind and tide power generation, solar heating and biomass production. Direct conversion to electricity through the use of photocells yields no net energy and a yield ratio of less than one (Odum & Odum, 1976).

Temperature gradient generation uses the difference in temperature between deep ocean and surface waters to generate electricity and is still largely theoretical and probably limited to areas near an ocean with high differences in surface and depth temperatures. Wind and tide powered generation of electricity is feasible and each has been applied; however, they are limited to areas of high steady winds or large differentials in tide levels.

Solar heating and cooling has been shown to work in most areas of the United States but the original costs are high and the net energy ratio is just above one (Odum and Odum, 1976). Improvements in design will probably improve efficiency.

Biomass production for use as fuel can substitute for fuel oil and natural gas and even gasoline, on a limited scale. In land areas that are underutilized or not suitable to the production of food, fiber or wood

products, the growing of fuel crops and fuel wood will not sacrifice needed cropland. If energy intensive methods are used to produce the lower quality fuel crops, the net energy will be low (Burnell, 1978).

8. Conservation is definitely the environmentally preferred alternative to canceling the sale. Conservation would lead to potentially lower energy demand and environmental impact.

Conservation can be achieved by lower economic growth which means lower demand. It is easy to see that lower economic growth is not a popular choice in a time of high unemployment; however, conservation may also be achieved by increasing the energy efficiency of heating, transportation, power usage, etc. By using technological and procedural changes, such as controlled fuel injection or heating people instead of rooms, energy efficiency can conserve without lowering the standard of living (Demand and Conservation Panel, 1978).

Through applied research in fuel conservation, both government and industry can improve the efficiency of motors and their applications. This can be done by identifying and funding research and development of energy efficient projects (Grey, et al., 1978); however, this alternative cannot be chosen by the Secretary of the Interior alone, but must be chosen by the U.S. government, by industry, and ultimately by the public.

Table 12 gives the alternative energy resources required to replace the sale's equivalent Btu production, the production leadtime and the Btu's generated per kilowatt hour (Btu/kwh).

Table 12

Alternative Energy Resource Replacements for Sales A62 and 62

Conditional Mean Sale Production	Resource Units	Production Lead Time (years)	Btu/kwh
Oil (barrels)	27.1×10^6	3-5	10.8×10^3
Gas (cubic feet)	735.0×10^9		10.2×10^3
Alternative Energy Resources			
Foreign oil (bbls) 1/	157.9×10^6	-	10.8×10^3
Foreign gas (cf) 2/	887.3×10^7	-	10.2×10^3
Coal (tons) 3/	35.0×10^6	3-5	10.4×10^3
Hydroelectric (kw capacity) 3/	6.7×10^5	8-12	10.4×10^3
Nuclear fuel (tons, U_3O_8) 4/	2.3×10^3	8-10	10.8×10^3
Solar/biomass (tons, agricultural residue) 5/	61.0×10^6	10 (est.)	-
Geothermal (bbls) 6/	4.9×10^9	5-7	21.6×10^3

1/ One barrel of oil = 5.6×10^3 cubic feet of natural gas.

2/ One short ton of coal = 26.2×10^6 Btu's.

3/ Kw capacity of hydroelectric plant for 15 years.

4/ One short ton U_3O_8 = 400×10^9 Btu's.

5/ One ton agricultural residue = 15×10^6 Btu's when used as primary burning fuel.

6/ Reserve estimate with 15% recovery factor at wellhead.

Source: BLM, 1979.

Section V

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Section VI

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Section VII

Consultation And Coordination

VII

VII. CONSULTATION AND COORDINATION

As authorized by the OCS Lands Act, as amended, BLM and USGS serve as the primary Federal agencies administering these lease sales. They have coordinated with each other continuously, as well as coordinated as appropriate with other Federal, state and non-governmental agencies and organizations. These include the following:

Department of Commerce (NOAA)
Department of Defense
Department of Energy
Department of the Interior
- Bureau of Mines
- Fish and Wildlife Service
- Heritage Conservation and Recreation Service
- National Park Service

Department of Transportation
Department of the Treasury
Environmental Protection Agency
Federal Energy Regulatory Commission
Marine Mammal Commission
Nuclear Regulatory Commission
Corps of Engineers
Department of Archives and History (Mississppi)
Alabama Historical Commission
Texas Historical Commission
Texas Antiquities Commission
Office of Program Development (Louisiana)
Florida Institute for Oceanography
Department of Natural Resources (Louisiana)
Office of the Governor (Texas)
Department of State (Florida)
Mississippi Marine Resources Council
Geological Survey of Alabama
State Clearinghouse for Federal Programs
State Oil and Gas Board (Alabama)

Certain aspects of consultation and coordination are mandated by the National Environmental Policy Act (NEPA). New regulations establishing uniform procedures for implementing NEPA were issued by the Council on Environmental Quality (CEQ) (Executive Office of the President) November 29, 1978. As summarized in the *Federal Register*, the principal aims of the regulations are to reduce paperwork, reduce delays and produce better decisions in the preparation of environmental impact statements.

One very innovative aspect of the new CEQ regulations is the requirement for "an early and open process for determining the scope of issues to be addressed and for identifying the significant issues related to a proposed action." They specify that "this process shall be termed scoping." The name of the process reflects the intent that it should "determine the scope and the significant issues to be analyzed in depth in the environmental impact statement."

With regard to Proposed Sales A62 and 62, the New Orleans OCS Office started the scoping process in January 1979 after coordinating with the Governor's OCS coordinator in each affected state in order to utilize state suggestions and to maximize public participation. Eight cities were designated as scoping sites

on the basis of geographical coverage, population and impact potential. The cities designated were Brownsville and Galveston, Texas; Morgan City and New Orleans, Louisiana; Gulfport, Mississippi; Mobile, Alabama; Pensacola and Panama City, Florida.

Regional Clearinghouses were contacted in the areas where meetings would be held in order to obtain recommendations for specific meeting sites and other relevant information (such as costs). Specific contacts were then made to reserve meeting rooms.

Population centers in coastal areas, as well as state capitals and other cities in which there might be significant interest, were identified. Legal notices and news releases were placed in area newspapers giving information about Sale 62 and the forthcoming meetings. Areawide radio and television stations in the scoping cities and surrounding areas were mailed copies of the news release, as were all addressees on a new "scoping mailing list" compiled from the general EIS mailing list.

The studies meeting normally held preparatory to a proposed sale was incorporated into the scoping process. All states affected by the sale, as well as all appropriate Federal agencies, were invited to send representatives to identify issues of concern to them.

The required "Notice of Intent to Prepare an Environmental Impact Statement for Proposed OCS Sale 62" was published in the *Federal Register* March 13, 1979. It incorporated most of the material in the news release and was prepared according to the CEQ regulations.

Despite considerable efforts to publicize the meetings, overall attendance was disappointingly small. In several instances private citizens and representatives of the news media suggested that there was insufficient publicity; therefore, after the first three meetings, a revised news release was mailed to news media in the remaining affected states, together with a cover letter pointing out that the scoping meetings could be "of vital concern to the regions (they) served." This letter also requested copies of any news stories or announcements published and/or notice of radio broadcasts made in order to determine the most effective ways of keeping the public informed of proposed government actions.

The chief concerns voiced by those who attended the scoping meetings were the effect of the proposed sales on fishing, employment and military activities in a multiple-use area. A copy of the minutes for each meeting is on file in the New Orleans OCS Office.

Section VIII

Appendices

APPENDIX A

TENTATIVE TRACT LIST

APPENDIX A.

PROPOSED TRACT LIST
OCS SALE NO. A62

Tract	Block	Description	Reserve	Acreage	Distance From Shore (nmi)	Water Depth (m)
SABINE PASS AREA						
A62-1	12	All	G	5000	15	10
A62-2	14	All	G	5000	17	12
WEST CAMERON AREA						
A62-3	53	All	G	5000	7	10
A62-4	54	All	G	5000	9	10
A62-5	58	All	G	5000	9	10
A62-6	59	All	G	5000	10	10
A62-7	64	All	G	5000	10	10
A62-8	68	N½	G	2500	7	10
A62-9	79	All	G	5000	12	10
A62-10	90	All	G	5000	13	10
A62-11	91	All	G	5000	14	10
A62-12	97	All	G	5000	14	10
A62-13	166	All	G	5000	26	14
A62-14	167	All	G	5000	26	14
A62-15	203	All	G	5000	34	16
A62-16	211	All	G	5000	37	16
A62-17	240	All	G	5000	44	20
WEST CAMERON AREA, WEST ADDITION						
A62-18	157	All	G	2170.32	18	12
A62-19	289	All	G	5000	26	12
A62-20	290	All	G	5000	27	12
A62-21	291	All	G	5000	28	14
A62-22	293	All	G	5000	30	12
A62-23	298	All	G	5000	30	14
A62-24	299	All	G	5000	31	14
A62-25	300	All	G	5000	32	14
A62-26	315	All	G	5000	40	18
A62-27	317	All	G	5000	43	20
A62-28	363	All	G	5000	57	24
WEST CAMERON AREA, SOUTH ADDITION						
A62-29	489	All	G	5000	83	40
A62-30	490	All	G	5000	84	42
A62-31	518	All	G	5000	90	52
A62-32	519	All	G	5000	90	52
A62-33	523	All	G	5000	93	54

Tract	Block	Description	Reserve	Acreage	Distance From Shore (nmi)	Water Depth (m)
WEST CAMERON AREA, SOUTH ADDITION (continued)						
A62-34	547	All	G	5000	99	60
A62-35	548	All	G	5000	99	58
A62-36	553	All	G	5000	94	58
A62-37	646	All	G	5000	118	140
EAST CAMERON AREA						
A62-38	2	1/	G	2413.79 (est.)	3	8
A62-39	16	1/	O&G	2417.32 (est.)	3	8
A62-40	43	All	G	5000	12	14
A62-41	50	All	G	5000	15	16
A62-42	65	All	G	5000	23	16
A62-43	66	S½	G	2500	22	16
EAST CAMERON AREA, SOUTH ADDITION						
A62-44	348	All	G	5000	103	90
A62-45	349	All	G	5000	104	90
VERMILION AREA						
A62-46	77	All	G	5000	19	10
A62-47	78	All	G	5000	20	12
A62-48	89	All	G	5000	21	6
A62-49	91	All	G	5067.26	21	6
A62-50	221	All	G	5204.83	60	34
VERMILION AREA, SOUTH ADDITION						
A62-51	275	All	G	5000	74	54
A62-52	280	All	G	5000	75	54
A62-53	304	All	G	5000	83	60
A62-54	305	All	G	5000	83	60
A62-55	306	All	G	5000	82	62
A62-56	317	All	G	5000	83	62
A62-57	318	All	G	5000	85	62
A62-58	326	All	G	5000	96	64
A62-59	336	All	G	5000	86	68
A62-60	341	All	G	5000	92	68
A62-61	350	All	G	5000	94	72
A62-62	396	All	G	5000	99	126
SOUTH MARSH ISLAND AREA						
A62-63	24	All	O&G	5000	35	24
A62-64	34	All	G	5000	44	26
A62-65	62	All	G	5000	55	36
A62-66	64	All	G	2965.03	56	38

Tract	Block	Description	Reserve	Acreage	Distance From Shore (nmi)	Water Depth (m)
SOUTH MARSH ISLAND AREA, SOUTH ADDITION						
A62-67	100	All	O&G	5000	72	52
A62-68	122	All	O	5000	78	60
A62-69	160	All	O&G	5000	85	82
A62-70	198	All	G	3545.99	101	120
SOUTH MARSH ISLAND AREA, NORTH ADDITION						
A62-71	231	All	O&G	5000	14	4
A62-72	232	All	O&G	4818.68	14	4
A62-73	234	2/	O&G	1756.63	17	6
A62-74	236	All	O&G	5000	14	6
A62-75	242	All	O&G	5000	15	6
A62-76	247	All	O&G	4926.98	22	6
A62-77	274	All	O&G	5035.27	26	14
EUGENE ISLAND AREA						
A62-78	76	All	G	5000	19	6
A62-79	90	N½; SW¼	O	3750	23	8
A62-80	113A	All	O&G	5000	32	16
A62-81	116	W½	O&G	2500	28	12
A62-82	117	All	O&G	5000	26	12
A62-83	129A	All	G	3824.72	30	18
A62-84	133	All	O	5000	35	18
A62-85	142	All	G	5000	26	14
A62-86	143	All	G	5000	24	12
A62-87	146	All	G	5000	27	14
A62-88	147	All	G	5000	28	16
A62-89	148	All	G	5000	29	16
A62-90	159	All	O&G	5000	38	22
A62-91	160	All	O&G	5000	36	22
A62-92	181	All	O&G	5000	44	28
A62-93	182	All	O&G	5000	42	26
A62-94	226	All	G	5000	52	40
A62-95	240	All	G	5000	53	42
EUGENE ISLAND AREA, SOUTH ADDITION						
A62-96	396	All	O&G	5000	94	140
SHIP SHOAL AREA						
A62-97	12	All	G	5000	6	4
A62-98	13	3/	G	4357.81 (est.)	5	4
A62-99	14	4/	G	3237.49 (est.)	4	4
A62-100	50	All	O&G	5000	10	4
A62-101	67	1/	G	587.05 (est.)	3	8
A62-102	173	All	G	5000	24	8

Tract	Block	Description	Reserve	Acreage	Distance From Shore (nmi)	Water Depth (m)
SHIP SHOAL AREA, SOUTH ADDITION						
A62-103	319	All	G	5000	63	90
A62-104	332	All	G	5300.60	64	94
SOUTH TIMBALIER AREA						
A62-105	76	All	O&G	5000	20	18
A62-106	77	All	O&G	5000	20	18
A62-107	96	All	O&G	5000	23	18
A62-108	97	All	O&G	5000	22	18
A62-109	160	All	G	5000	33	40
A62-110	174	All	G	3772.18	36	38
A62-111	192	All	G	5000	38	40
A62-112	200	All	G	5000	42	40
A62-113	208	All	G	5000	43	58
A62-114	209	All	G	5000	44	62
SOUTH TIMBALIER AREA, SOUTH ADDITION						
A62-115	227	All	G	5000	46	62
A62-116	228	All	G	5000	47	64
A62-117	246	All	G	5000	51	56
A62-118	269	All	G	5000	54	66
A62-119	274	All	G	5000	56	76
A62-120	284	All	G	5000	57	106
A62-121	285	All	G	2148.46	58	112
A62-122	287	All	G	5000	60	130
SOUTH PELTO AREA						
A62-123	2	1/	O&G	3344.50 (est.)	3	8
A62-124	3	1/	O&G	4756.84 (est.)	4	10
A62-125	4	All	O&G	5000	5	10
A62-126	7	All	O&G	5000	8	12
GRAND ISLE AREA						
A62-127	34	All	O&G	5000	12	26
GRAND ISLE AREA, SOUTH ADDITION						
A62-128	91	All	G	5000	37	78
A62-129	100	All	G	4539.89	44	64
A62-130	101	All	G	4539.89	46	68
WEST DELTA AREA						
A62-131	27	All	O&G	5000	3	10
A62-132	102	All	O&G	5000	18	66

Tract	Block	Description	Reserve	Acreage	Distance From Shore (nmi)	Water Depth (m)
WEST DELTA AREA, SOUTH ADDITION						
A62-133	143	All	O&G	5000	19	108
A62-134	144	All	O&G	5000	18	116
A62-135	147	All	O&G	5000	21	120
A62-136	148	All	O&G	5000	22	90
SOUTH PASS AREA						
A62-137	35	1/	O&G	741.70 (est.)	3	46
A62-138	38	1/	O&G	4747.92 (est.)	4	40
A62-139	45	All	G	4999.96	8	70
A62-140	56	5/	O&G	2999.84 (est.)	6	70
MAIN PASS AREA						
A62-141	77 78	1/	O&G	4655.16 (est.)	3	44
A62-142	108	All	G	4994.55	40	2
A62-143	126	All	O&G	4994.55	22	10
A62-144	150	All	O&G	4994.55	11	68
MAIN PASS AREA, SOUTH AND EAST ADDITION						
A62-145	265	All	G	4994.55	43	70
A62-146	301	All	O	4999.96	13	70
A62-147	315	All	G	4999.96	17	80
BRETON SOUND AREA						
A62-148	39	1/	O&G	1237.38 (est.)	15	4
A62-149	40	1/	O&G	4877.30 (est.)	17	4
A62-150	41	All	O&G	4994.55	15	8
A62-151	42	1/	O&G	4551.84 (est.)	13	8
A62-152	43	1/	O&G	1994.55 (est.)	11	8
A62-153	54	N½; N½SW¼; N½S½SW¼; SW¼SW¼SW¼; N½SE¼; N½S½SE½;	O&G	4448.27	9	10
A62-154	55	N½	O&G	2497.27	11	10
CHANDELEUR AREA						
A62-155	17	All	G	5000	32	4
A62-156	25	All	G	5000	40	20
A62-157	32	All	G	5000	39	20
A62-158	33	All	G	5000	42	4
A62-159	34	All	G	5000	45	4

Tract	Block	Description	Reserve	Acreage	Distance From Shore (nmi)	Water Depth (m)
VIOSCA KNOLL NH 16-7						
A62-160	24	All	O	5760	16	20
A62-161	68	All	O	5760	16	20
A62-162	864	All	O&G	5760	43	410
A62-163	865	All	O&G	5760	45	410
A62-164	908	All	O&G	5760	43	600
A62-165	909	All	O&G	5760	46	700
EWING BANK NH 15-12						
A62-166	304	All	G	3140.42	32	150
MISSISSIPPI CANYON NH 16-10						
A62-167	149	All	G	5611.56	11	220
GREEN CANYON NG 15-3						
A62-168	89	All	G	5760	102	200
A62-169	90	All	G	5760	101	140
A62-170	91	All	G	5760	100	220
A62-171	133	All	G	5760	105	250
A62-172	134	All	G	5760	104	200
A62-173	135	All	G	5760	103	250
A62-174	136	All	G	5760	102	350
A62-175	137	All	G	5760	101	400
A62-176	138	All	G	5760	98	450
A62-177	139	All	G	5760	96	400
A62-178	140	All	G	5760	95	350
A62-179	179	All	G	5760	106	500
A62-180	180	All	G	5760	105	500
A62-181	181	All	G	5760	104	700
A62-182	182	All	G	5760	100	500
A62-183	183	All	G	5760	99	500
A62-184	184	All	G	5760	98	450
DESTIN DOME NH 16-8						
A62-185	24	All	O	5760	30	86
A62-186	25	All	O	5760	30	80
A62-187	26	All	O	5760	30	76
A62-188	27	All	O	5760	29	60
A62-189	28	All	O	5760	28	65
A62-190	29	All	O	5760	28	62
A62-191	66	All	O	5760	33	122
A62-192	67	All	O	5760	33	115
A62-193	68	All	O	5760	33	105
A62-194	69	All	O	5760	32	92
A62-195	70	All	O	5760	32	80

Tract	Block	Description	Reserve	Acreage	Distance From Shore (nmi)	Water Depth (m)
DESTIN DOME NH 16-8 (continued)						
A62-196	71	All	O	5760	31	74
A62-197	72	All	O	5760	31	71
A62-198	73	All	O	5760	31	70
A62-199	110	All	O	5760	35	130
A62-200	111	All	O	5760	35	120
A62-201	112	All	O	5760	35	110
A62-202	113	All	O	5760	35	90
A62-203	114	All	O	5760	34	85
A62-204	115	All	O	5760	34	78
A62-205	116	All	O	5760	34	72
A62-206	117	All	O	5760	33	72
A62-207	154	All	O	5760	39	140
A62-208	155	All	O	5760	39	130
A62-209	156	All	O	5760	39	120
A62-210	157	All	O	5760	38	100
A62-211	158	All	O	5760	38	90
A62-212	159	All	O	5760	38	90
A62-213	160	All	O	5760	37	88
A62-214	161	All	O	5760	36	84
A62-215	202	All	O	5760	41	115
A62-216	203	All	O	5760	41	110
A62-217	204	All	O	5760	41	100
A62-218	205	All	O	5760	40	90
A62-219	247	All	O	5760	43	118
A62-220	248	All	O	5760	43	110
A62-221	249	All	O	5760	43	100
WEST CAMERON AREA, SOUTH ADDITION						
A62-222	648	All	G	5000	118	140

1/ That portion of the lease block which is more than three geographical miles seaward from the line described in the supplemental decree of the U.S. Supreme Court, June 16, 1975 (United States vs. Louisiana, 422 U.S. 13).

2/ That portion of the lease block located landward of a line three marine leagues seaward of a line extending from a point on Shell Keys at a latitude 29°24'32.15"N., longitude 91°51'16.59"W., (X = 1,834,019.00, Y = 270,301.00), northwesterly in a straight line to Tigre Point at latitude 29°32'23.13"N.,, longitude 92°14'57.15"W., (X = 1,708,756.00, Y = 318,661.00). The coordinates used refer to the Louisiana Plane Coordinate System, South Zone.

3/ That portion of the lease block which is more than three geographical miles seaward from the line described in the supplemental decree of the U.S. Supreme Court, June 16, 1975 (United States vs. Louisiana, 422 U.S. 13) excluding the S½SE¼.

4/ That portion of the lease block which is more than three geographical miles seaward from the line described in the supplemental decree of the U.S. Supreme Court, June 16, 1975 (United States vs. Louisiana, 422 U.S. 13) excluding the S½S½.

5/ That portion of the lease block located landward of a line which is more than three geographical miles seaward from the line described in the supplemental decree of the U.S. Supreme Court, December 13, 1965, United States vs. Louisiana No. 9 Original (382 U.S. 288).

Notes: G = gas prone; O = oil prone; O&G = oil and gas prone.

This tract list contains approximately 1,099,057.37 acres.

PROPOSED TRACT LIST
OCS SALE NO. 62

Tract	Block	Description	Reserve	Acreage	Distance From Shore (nmi)	Water Depth (m)
SOUTH PADRE ISLAND AREA, EAST ADDITION						
62-1	A-64	All	G	5760	39	58
62-2	A-65	All	G	5760	42	64
62-3	A-70	All	G	5760	42	62
62-4	A-71	All	G	5760	39	58
NORTH PADRE ISLAND AREA						
62-5	946	All	G	5760	16	32
62-6	966	All	G	5760	15	32
MUSTANG ISLAND AREA						
62-7	791	All	G	5760	16	28
62-8	800	All	G	5760	15	28
62-9	A-22	All	G	5760	35	62
62-10	A-31	All	G	5760	36	66
MUSTANG ISLAND AREA, EAST ADDITION						
62-11	A-124	All	G	5760	54	120
62-12	A-128	All	G	5760	57	142
62-13	A-129	All	G	5760	56	120
MATAGORDA ISLAND AREA						
62-14	528	All	G	5760	13	22
62-15	568	All	G	5760	18	24
62-16	639	All	G	5760	22	32
62-17	640	All	G	5760	23	34
62-18	649	All	G	5760	24	36
62-19	653	All	G	5760	19	28
62-20	654	All	G	5760	17	26
62-21	668	All	G	5760	19	30
62-22	685	All	G	5760	20	30
62-23	701	All	G	5760	22	32
62-24	712	All	G	5760	25	38
BRAZOS AREA						
62-25	449	1/	G	2270 (est.)	11	20
62-26	450	1/	G	5695 (est.)	12	20
62-27	475	All	G	5760	15	22
62-28	501	All	G	5760	30	32
62-29	502	All	G	5760	31	32

Tract	Block	Description	Reserve	Acreage	Distance From Shore (nmi)	Water Depth (m)
BRAZOS AREA (continued)						
62-30	530	All	G	5760	16	24
62-31	578	All	G	5760	32	36
62-32	A-7	All	G	5760	34	36
62-33	A-39	All	G	5760	34	44
62-34	A-40	All	G	5760	38	42
62-35	A-41	All	G	5760	36	42
GALVESTON AREA						
62-36	253	All	G	5760	15	16
62-37	272	All	G	5760	16	18
62-38	301	All	G	5760	17	10
62-39	302	All	G	5760	16	10
62-40	303	All	G	5760	13	10
62-41	304	1/	G	5315 (est.)	12	18
62-42	392	All	G	5760	25	28
62-43	421	All	G	5760	27	30
62-44	426	All	G	5760	29	32
62-45	427	All	G	5760	28	32
62-46	A-100	All	G	5760	60	46
HIGH ISLAND AREA						
62-47	49	All	G	5760	17	12
62-48	50	All	G	5760	15	12
62-49	72	N½; SE¼	G	4320	20	10
62-50	94	All	G	5760	14	14
62-51	108	All	G	5760	16	14
62-52	161	E½; NE¼NE¼NW¼; SE¼NE¼SW¼; NE¼SW¼SW¼; S½SW¼SW¼; SE¼SW¼	G	3690	27	16
62-53	200	All	G	5760	31	14
62-54	201	All	G	5760	33	18
HIGH ISLAND AREA, SOUTH ADDITION						
62-55	A-417	All	G	5760	78	48
62-56	A-437	All	G	5760	71	46
62-57	A-438	All	G	5760	73	46
62-58	A-439	All	G	5760	75	48
62-59	A-440	All	G	5760	77	50
62-60	A-444	All	G	5760	81	54
62-61	A-445	All	G	5760	79	52
62-62	A-454	All	G	5760	62	44
62-63	A-455	All	G	5760	60	42
62-64	A-470	All	G	5760	86	62
62-65	A-472	All	G	5760	82	56

Tract	Block	Description	Reserve	Acreage	Distance From Shore (nmi)	Water Depth (m)
HIGH ISLAND AREA, SOUTH ADDITION (continued)						
62-66	A-543	All	G	5760	94	72
62-67	A-569	All	G	5760	99	86
62-68	A-576	All	G	5760	101	94
62-69	A-578	All	G	5760	96	100
HIGH ISLAND AREA, EAST ADDITION, SOUTH EXTENSION						
62-70	A-267	All	G	5760	78	44
62-71	A-282	All	G	5760	85	54
CORPUS CHRISTI NG 14-3						
62-72	700	All	G	5760	71	420
62-73	743	All	G	5760	70	450
62-74	744	All	G	5760	73	470

1/ That portion of the lease block seaward of the Three Marine League Line.

Note: G = gas prone.

This tract list contains approximately 418,730.00 acres.

APPENDIX B

SUMMARY
IMPACT ASSESSMENT

APPENDIX B. SUMMARY IMPACT ASSESSMENT

Impact Area	Degree of Expected Impact* Local	Regional	Expected Impact and Assessment Summary
A. Biological Environment			
1. Fish and Wildlife			
a. Amphibians	0	0	No apparent negative impact from Gulf of Mexico OCS oil/gas activities.
b. Birds	—/s	0	Localized short-term effects to diving bird species from oil spills.
** c. Endangered species	—/s	U	Localized short-term effects to endangered diving birds and marine turtles from oil spills. Uncertain regional effects due to lack of data.
d. Fish	0	U	Same as A.1.a., uncertain regional effects due to lack of information.
e. Mammals	0	U	Same as A.1.d.
f. Reptiles	—/s	U	Localized short-term effects on marine turtles from oil spills. Uncertain regional effects due to lack of data.
2. Plants			
a. Algae	0	0	Same as A.1.a.
b. Plankton	—/s	0	Localized short-term effects from turbidity, formation waters and oil spills.
c. Vascular plants			
(1) Emergent	—/s	0	Localized short-term effects from oil spills.
(2) Submerged	0	0	Same as A.1.a.
3. Communities			
a. Beaches and barrier islands	—/s	—/c	Localized short-term effects from oil spills and/or facility construction.
b. Biological sensitive areas	0	0	Implementation of the biological resource stipulation should avoid or mitigate impacts.
c. Estuaries and embayments	—/s	—/c	Same as A.3.a.
d. Marshes and wetlands	—/s	—/c	Same as A.3.a.
4. Ecological Relationships			
a. Biological cycles	—/s	U	Localized short-term effects due to oil spills and facility construction, uncertain regional effects due to lack of data.
b. Community function	U	U	Uncertain effects due to lack of data.
c. Community structure	U	U	Same as A.4.b.

* Refer to symbol identification at end of Appendix.

** Indicates issues which are addressed in Sections II and IV.

Impact Area	Degree of Expected Impact Local	Regional	Expected Impact and Assessment Summary
d. Food-web relationships	—/s	U	Same as A.4.a.
e. Habitat diversification	U	U	Same as A.4.b.
f. Nursery ground aspects	—/s	U	Same as A.4.a.
g. Succession	U	U	Same as A.4.b.
B. Physical Environment			
** 1. Air Quality			
a. Offshore	—/s	0	Localized short-term effect from oil spills, blowouts and activities. Federal regulations should mitigate impacts.
b. Onshore	—/l	0	Localized long-term effects from terminal/storage facilities. Federal, state and local regulations should mitigate impacts.
** 2. Water Quality			
a. Offshore	—/s	0	Same as B.1.a.
b. Onshore	—/s	0	Same as B.1.a.
C. Social and Economic Environment			
1. Cultural Resources			
a. Historic	U	—/l/c	Assuming implementation of the cultural resource survey requirement on all leases within the area of high probability for occurrence of significant cultural resources (see visual 4), impacts to the largely unknown resource base would be avoided or mitigated as far as is currently technologically feasible.
b. Prehistoric	U	U/c	Same as C.1.a.
** 2. Fisheries Resources	0	U	No apparent negative impact from OCS oil/gas activities, but uncertain regional effects due to lack of data.
3. Multiple Use Areas			
** a. Military warning areas	——/l	——/c	Major long-term multiple use conflict in military warning areas; military area stipulation should mitigate conflicts.
b. Ports	—/s	0	Minor localized multiple use conflict in ports due to increased boat traffic.
4. Recreation			
** a. Shoreline recreational resources	—/s	—/s/c	Minor, intermittent, physical and visual pollution most likely to affect beachfront recreators.
** b. Recreational fishing	+/c	++/c	Production platforms will become recreation destination areas.
** 5. Employment			
a. Exploration and development phase	+/s	+/s	Short-term increase in local and regional employment opportunities

Impact Area	Degree of Expected Impact Local	Regional	Expected Impact and Assessment Summary
a. Exploration and development phase (cont.)			with potential to reduce unemployment. Estimated short-term direct employment job opportunities vary between 374 to 1,507 over an 8 year period.
b. Production phase	++/l	++/l	Long-term increase in local and regional direct employment job opportunities of between 280 and 350 over a period of at least 10 years is estimated.
6. Population, change	0	0	Maximum assumed population increase in local areas where onshore operations bases are anticipated is expected to be less than 1% of the total existing population.
7. Housing	+	0	Total housing demand for estimated new resident employees is estimated at about 1,400 HU. This anticipated demand represents a very small percentage of the existing housing stock and should be met with existing vacancies and a small amount of new construction. This demand may raise property values in certain locations.
8. Local Business Activity	+	NA	OCS activity will generate a moderate increase in local purchases of industrial and commercial goods and services. Personal consumption of locally purchased goods and services will increase in relation to the amount of new resident population and income.
9. Community Infrastructure			
a. Education	—/s	0	New resident population will result in additional school age children in local areas. The estimated number of new school age children is small and is not anticipated to cause a significant change in existing pupil/teacher ratios.
b. Public safety	0	0	Estimated small increases in resident population of local areas is not expected to lower the quality of service.
c. Water supply	0	0	Same as C.9.b.
d. Sewage treatment	0	0	Same as C,9.b.
e. Solid waste disposal	0	0	Same as C.9.b.
f. Electric power	0	0	Same as C.9.b.

Impact Area	Degree of Expected Impact Local	Regional	Expected Impact and Assessment Summary
g. Recreation facilities	0	0	Same as C.9.b.
h. Transportation/traffic	U/s	0	OCS direct, indirect and induced activity will result in a small increase in truck and other vehicular traffic which will contribute to the potential for traffic congestion at some locations. Air quality will not be significantly affected.
10. Local Fiscal Balance	0	0	Local public revenue generated by OCS activity is expected to equal or exceed the additional net requirement for increased local public expenditures for government services. No increase in local revenue producing measures (property tax increase) should be necessitated by the proposed lease sale.
11. Land Use Conflicts and Competition	0/U	0	Use of existing operatons bases, building space and industrial sites in Louisiana, Texas and Florida with only minor additional acreage requirement is assumed. No refineries or gas processing plants or acreage for expansion of existing facilities is assumed. Three additional or expanded shore terminals (including storage facilities), one each in Florida, Louisiana and Texas will require up to 40 acres per site. This land is expected to be located in accordance with local planning and zoning, and Coastal Zone Management Regulations so that actual land use conflicts and environmental impacts will be small.

Symbols used for degree of expected impact:

++ Very positive impact
+ Somewhat positive impact
0 Apparently neutral or no impact
— Somewhat negative/adverse impact
—— Very negative/adverse impact
U Considerable uncertainty about net impact
s Short-term effect (less than 1 year)
l Long-term effect (greater than 1 year)
c Cumulative effect

APPENDIX C

ARCHAEOLOGICAL REPORT STANDARDS

APPENDIX C. ARCHEOLOGICAL REPORT STANDARDS

1. Description of tract surveyed to include tract number, OCS number, block number, geographic area, e.g., Mobile South No. 1 Area, and water depth.

2. a) Map (1" = 4,000') of the lease block showing the area surveyed and the location of the anomalies in the area.

b) Navigation postplot map (1" = 1,000') of area surveyed showing tract lines and shotpoints with U.T.M. X and Y coordinates and latitude-longitude reference points. This map will be marked with a North Arrow. This map, or a separate map at the same scale will also include all potentially significant geologic features (bottom and subbottom down to the terminal Pleistocene horizon) including, but not limited to, tidal estuaries, embayments, barrier islands and stream channels. All unidentified magnetic anomalies should be placed on this map. Clusters of anomalies of potential cultural significance should also be outlined.

3. Survey personnel and duties.

4. Survey instrumentation, procedures and logs including the following:

a) type of instrumentation used.
b) survey procedures.
c) statement of record and survey quality.
d) magnetometer tow fish depth.
e) vessel speed.
f) instrument scale and sensitivity settings.
g) correction for sensor offset.

5. Sea state.

6. The original of a selected line of survey data for each instrument used shall be submitted with each report. In all cases where an anomaly is encountered, the original of all survey data for the line(s) indicating the anomaly shall be submitted.

7. Archeological assessment, with a signed statement as to the possible existence of a cultural resource. The archeological assessment shall include the following:

a) evidence of a records search for reported shipwreck locations.
b) prehistoric habitation site potential within the survey area including analysis of:

1) the potential for site occurrence based on the existence of subbottom geologic features with a high probability of associated prehistoric habitation sites, the general age of such features, and the probable depositional environment of the Holocene sediments overlying the terminal Pleistocene horizon and their archeological potential. Much of this information must be taken from existing literature sources.

2) the potential for site preservation in light of historic and prehistoric marine processes. This information also must be taken from existing literature sources.

3) the recoverability of potential sites in light of current technology based on the depth (below the mudline) of the terminal Pleistocene horizon and other strata with archeological site potential.

c) historic cultural resource potential including an analysis of:

1) unidentified magnetic anomalies and possible anomaly clusters in terms of their potential as shipwreck distributions.

2) correlations between magnetic anomalies and known ferro-magnetic sources.

d) all conclusions and recommendations must be tied to the analysis and supported.

8. Two copies of the report shall be submitted to the USGS, Gulf of Mexico Area and also two copies to the New Orleans OCS Office, BLM.

APPENDIX D

ALTERNATIVES TO THE EXISTING CULTURAL LEASE STIPULATION

APPENDIX D. ALTERNATIVES TO THE STANDARD CULTURAL LEASE STIPULATION

In a S.O. 2974 coordination meeting for Proposed Sales 58A, 62 and A62 held on April 12, 1979, and attended by members of the USGS, Gulf of Mexico Area and the New Orleans BLM OCS Office, the following alternatives to the current standard cultural resource lease stipulation and NTL 78-3 were proposed:

1. This alternative would leave the standard cultural resource lease stipulation unchanged, but revise the NTL to require a minimum 75 m line spacing for cultural surveys.

2. This alternative would require a major change in the current cultural resource lease stipulation and NTL. The new lease stipulation and NTL would require a multi-purpose survey (shallow hazard, geological, archeological, and biological) and a complete analysis of the data by the geophysist. The survey report would address all of the data in light of the specific questions important to each resource. A professional marine archeologist would be used only when review by BLM and GS indicates that further archeological investigations are necessary.

3. This alternative would not require changes in the current lease stipulation or NTL, but based on the current NTL, more stringent report standards would be developed for the archeological report.

APPENDIX E

BIOLOGICAL OPINIONS

NATIONAL MARINE
FISHERIES SERVICE
St. Petersburg, Florida
RECEIVED
APR 2 - 1979
ROUTING
FSE1

MAR 29 1979

Mr. Donald P. Truesdell
Deputy Assistant Director
Department of the Interior
Bureau of Land Management
Washington, D.C. 20240

Dear Mr. Truesdell:

This letter is in response to your November 28, 1978, request for a formal consultation and to the January 30, 1979, request from Mr. J. R. Baisley, U.S. Geological Survey, for a joint consultation pursuant to Section 7 of the Endangered Species Act of 1973 (ESA), as amended, regarding endangered and threatened whales and turtles in the entire Gulf of Mexico Outer Continental Shelf (OCS) oil and gas leasing areas. Enclosed is the biological opinion resulting from the consultation which states that the identified activities are not likely to jeopardize the continued existence of endangered and threatened species or result in the destruction or adverse modification of habitat critical to them.

The Bureau of Land Management should reinitiate consultation if new information becomes available on possible impacts of the proposed activities on endangered or threatened species or their habitats, if modifications are made in these activities, or if a new species is listed which may be affected by these activities.

We look forward to continued cooperation in future consultations.

Sincerely yours,

Jack W. Gehringer
for Terry L. Leitzell
Assistant Administrator
for Fisheries

Enclosure

bcc: USGS-Balsley
cc: F, GCF, ESE, SWFC, FAK, NWAFC, FSW-Edmondsen, F6-Aron, GCF
(all w/enclosure)
F6:TRLoughlin:634-7461:3/20/79:pvt

ADDRESS ONLY THE DIRECTOR,
FISH AND WILDLIFE SERVICE

United States Department of the Interior

FISH AND WILDLIFE SERVICE
WASHINGTON, D.C. 20240

APR 10,1979

In Reply Refer To:
FWS/OES 375.4

MEMORANDUM

To: Director, Bureau of Land Management

From: Director

Subject: Biological Opinion Regarding Oil and Gas Leasing and Exploration Activities in the Gulf of Mexico

By memorandum received December 6, 1978, the Bureau of Land Management (BLM) requested formal consultation on a regional basis for the Gulf of Mexico oil and gas leasing activities (copy attached). At that time 16 species were included in the request. Through conversations with the BLM New Orleans OCS Office, ten species which could be affected were added to this list of species in order to include all the coastal Endangered and Threatened species found from Key West, Florida, to Brownsville, Texas.

In response to this request, I appointed a consultation team by memorandum of December 28, 1978, (copy attached) to assist me in determining whether leasing and exploration activities are likely to jeopardize the continued existence of the Endangered or Threatened species or result in the destruction or adverse modification of their Critical Habitat.

The team was comprised of Robert Jacobsen, Chief, Branch of Management Operations, Office of Endangered Species (OES); Nancy Sweeney, Team Leader, OES; Jack Edmundson, Team Leader, OES; Robert Cooke, Endangered Species Specialist (Region 4, Atlanta, Georgia); Jim Baker, Endangered Species Biologist (Region 4, Jacksonville, Florida); and Jim Barkuloo, Coastal Ecosystems Specialist (Region 4, Panama City, Florida).

AMERICAN REVOLUTION BICENTENNIAL 1776-1976

On January 30, 1979, the U.S. Geological Survey (GS) requested the inclusion of exploration activities in the regional Gulf consultation initiated by BLM on leasing activities (copy attached). Since exploration plans must be approved or disapproved within 30 days, the Fish and Wildlife Service (FWS) has insufficient time to consult on each exploration plan. The GS and FWS held a meeting on January 19, 1979, to discuss this issue. It was later decided, with the concurrence of BLM, that a combined consultation would be held for the Gulf of Mexico. Therefore, this consultation includes both BLM leasing and GS exploration activities for the Gulf.

On February 6 and 7, 1979, the consultation team met with BLM and GS representatives to discuss the leasing and exploration activities in the Gulf of Mexico. A list of participants is attached.

The consultation team reviewed reports, publications, and correspondence from knowledgeable sources on the species in question, and in addition, numerous telephone contacts were made with other experts. Information contained in Final Environmental Impact Statements (FEIS) for OCS Sales 51 and 65, western and central Gulf and eastern Gulf of Mexico, respectively, was carefully evaluated to ascertain the effects of the leasing and exploration activities. Copies of pertinent records and documents are included in an administrative record maintained at the Office of Endangered Species and are incorporated by reference.

Project Description

The BLM acts as agent for the Secretary, Department of Interior, in processing bids on the advertised lease sales. After issuance of the leases, primary regulatory authority for exploration, development, and production of the lease tracts shifts to GS and other Federal agencies.

Exploration of the OCS requires certain onshore support facilities including office space, helicopter and fixed-wing aircraft facilities, docks for boating activities, and supply bases. Due to the uncertain nature of oil exploration, companies are generally unwilling to construct new facilities to support this operation. They prefer instead to utilize existing areas and facilities.

At the present, there are numerous onshore facilities throughout the Gulf of Mexico being used for exploration activities. Should the use of these facilities be changed or additional onshore facilities be needed which may affect listed species or their habitats, consultation must be reinitiated. This biological opinion is based on two assumptions; that existing onshore facilities will be utilized and that the probability of an oil spill occurring, or reaching the species or habitat during exploration activities, is minimal.

Should exploration activities reveal the presence of significant amounts of hydrocarbons, development and production activities will take place. During these activites, new onshore facilities will be constructed when needed; barges and tankers will transport oil until necessary pipelines are installed, and oil spillage will occur. The development and production activities may affect Threatened and Endangered species, therefore, Section 7 consultation will be required. This biological opinion considers the leasing and exploration activities which may occur within the Gulf of Mexico provided that new facilities or patterns of use are not initiated. Development and production phases (referred to as development/production throughout this opinion) are not included in this opinion.

A summary of the biological data and considerations of the consultation team are provided for all 26 species.

Red Wolf (Canis rufus)

The red wolf was originally listed as Endangered in the Federal Register on October 13, 1970. Today, the only genetically pure population not in captivity may be found along the Gulf coast in Chambers and Jefferson Counties, Texas, and in Cameron and Vermilion Parishes, Louisiana.

Habitat for the red wolf is generally limited to coastal areas consisting of marshlands and coastal prairies, pine hardwood forests with heavy brush understory, and old fields overgrown with tall grasses and bushes. To date, Critical Habitat has not been determined for this species. The red wolf feeds primarily on rabbits, nutria, rodents, marsh birds, waterfowl, crabs, and carrion.

Several factors are known to be contributing to the decline of the red wolf, including: interbreeding with coyotes, urbanization, industrialization, hunting, trapping, and parasitism.

It is my biological opinion that leasing and exploration activities are not likely to jeopardize the continued existence of this species. However, any activity or program authorized, funded, or carried out by a Federal agency which may affect the Endangered red wolf or its habitat, particularly any new onshore facilities related to exploration and development/production activities of the lease areas, will require Section 7 consultation.

Attwater's Prairie Chicken (Tympanuchus cupido attwateri)

Attwater's prairie chicken was listed as an Endangered species in the Federal Register on March 11, 1967. Approximately 1,500 individuals of this species remain in local colonies on the mid-Texas coast. Coastal prairie is considered

an essential habitat component. Cord grass (Spartina spartinae) prairie is also capable of supporting prairie chickens where it is interlaced with knolls and ridges of better-drained ground. Prairie chickens can also live in favorable combinations of native prairie, pasture, and cultivated lands. Seed and seed pods of such plants as ruellia, stargrass, bedstraw, doveweed, and perennial ragweed are important food items.

Reduction of coastal prairie habitat has been an important factor leading to the decline of this species. In 1967 it was estimated that the species occupied 234,000 acres whereas today, it is estimated that 170,000 acres support the species. Based upon pending or planned conversion of coastal prairie, a further 16 percent reduction of supportable habitat will occur by the mid-1980's. Grazing, urban development, and hurricanes have also been associated with this decline. The reduction of viable prairie chicken habitat is resulting in the isolation of prairie chickens into small populations that are more susceptible to local extirpation.

Impacts from offshore leasing and exploration would be associated with the onshore development which could cause habitat destruction or disturbance of breeding and nesting activities. Since existing onshore facilities will be utilized during the exploration phase, it is my biological opinion that the leasing and exploration activities are not likely to jeopardize the continued existence of the species nor adversely modify habitat essential for its survival. However, any activity or program authorized, funded, or carried out by a Federal agency which may affect this species, particularly onshore facility proposals and proposed development/production activities, will require Section 7 consultation.

Arctic Peregrine Falcon (Falco peregrinus tundrius)

The Arctic peregrine falcon was listed as an Endangered species in the Federal Register on October 13, 1970. The bird is a medium sized falcon which is listed as Endangered in Canada, the United States, and Mexico. Critical Habitat has not yet been determined for this subspecies.

This subspecies breeds in the North American tundra and winters along the Gulf coast from Florida, west to the eastern Mexican coast and Baja California, south to mid-Chile and mid-Argentina, and possibly on Pacific Islands.

Field and laboratory evidence indicates that the decline of peregrine populations is generally due to the presence of chlorinated hydrocarbon pesticides in the falcon's food supply. This leads to reproductive failure through eggshell thinning and non-viable eggs, as well as, increased adult mortality. Other factors which may cause local decreases in reproductive success are human disturbance and adverse weather conditions during nesting.

Essential habitat for the Arctic peregrine includes preferred breeding areas near rivers, lakes, or the sea in the Arctic tundra, where nesting sites include cliffs, dykes, cutbanks, and occasionally boulders, hummocks, or the ground. While the Arctic peregrine migrates south through a broad area of eastern and middle North America to the Gulf coast, it funnels into coastal areas and concentrates along the beaches and barrier islands.

The Arctic peregrine feeds mostly on a wide variety of birds and occasionally on small mammals. Peregrines will kill oiled birds and in doing so, ingest considerable numbers of feathers with their meal. The impact of this ingested oil is unknown.

The possible impacts on Arctic peregrines from OCS leasing and exploration include the contamination of the peregrines' food sources and disruption of habitat along their migration route. Existing onshore facilities will be utilized for exploration, and the possibility of an oil spill during exploration activities is minimal. Therefore, it is my biological opinion that the leasing and exploration activities are not likely to jeopardize the continued existence of the Arctic peregrine. However, any onshore activities requiring new facilities or any activity or program, authorized, funded, or carried out by a Federal agency which may affect the Arctic peregrine or its habitat, including proposed development/ production activities, will require Section 7 consultation.

Red-Cockaded Woodpecker (Picoides (=Dendrocopos) borealis)

The red-cockaded woodpecker was listed as an Endangered species in the Federal Register on October 13, 1970. Recent literature indicates the species is presently decreasing in numbers and its populations are being fragmented by habitat loss.

The historic range of this non-migratory species includes the southeastern United States as far west as east Texas and southeastern Oklahoma, as far north as southern Missouri, southcentral Kentucky, and southeastern Maryland, and as far south as Long Pine Key in the Florida Keys. Their present distribution is thought to be similar to the above delineated range except that the extreme limits have contracted to some extent. More importantly, within the species range, its populations are becoming increasingly fragmented.

In all parts of its range, the red-cockaded woodpecker is found primarily in mature, open pine forests. The cavity trees are always living pine trees and usually over 60 years old with red-heart disease. The diet of the red-cockaded woodpecker is primarily arthropods and seasonally available fruits. Stomach analysis indicates that food consumption is about 81 percent insects and 19 percent vegetable matter.

The decline of this species has generally been attributed to habitat loss resulting from widespread changes in forest management practices over the past 25 years. Increased demands from the pulping industry, along with a general trends toward shorter timber rotations, has in many areas precluded the pine stands over 60 years old necessary for this species.

With the use of existing onshore facilities for exploration activities, it is my biological opinion that the leasing and exploration activities are not likely to jeopardize the continued existence of the species. However, any activity or program authorized, funded, or carried out by a Federal agency which may affect the red-cockaded woodpecker, particularly any proposed onshore facilities related to oil and gas exploration or development/production activities, will require Section 7 consultation.

Whooping Crane (Grus americana)

The whooping crane was originally listed as Endangered on March 11, 1967. Its wild breeding population nests in Wood Buffalo National Park, Northwest Territories, Canada, and winters from October to April on and adjacent to the Aransas National Wildlife Refuge in the Texas Gulf coastal areas.

Their migratory range includes the Canadian Provinces of the Northwest Territories, Alberta, Saskatchewan, Manitoba, and the States of Montana, North and South Dakota, Nebraska, Kansas, Oklahoma, and Texas. Critical Habitat has been determined for a portion of their migratory route and winter range and was published in the Federal Register on May 15, 1978.

The total population numbers a little over 100, though the wild Texas population as of January 1979 numbered 74. This represents an increase over the 15 known birds reported in 1939 and may be indicative of a continuing expansion of the whooping crane population.

Parents and young-of-the-year remain together as family units for nearly a year, separating on their return trip back to their muskeg nesting areas in Canada. Tidal salt flats, including ponds and estuaries, are typical winter habitat. On their wintering area in Texas, their preferred foods include blue and fiddler crabs, clams and mudshrimp from tidal areas, frogs, crayfish, and snails from freshwater ponds.

Factors which contributed to the decline of the whooping crane include the loss of habitat, overutilization of the species, and a low reproductive potential.

Since the whooping crane's major winter food items are aquatic organisms, an oil spill could prove harmful to the species. The whoopers feed in water by probing into mud. Further, its wading habits (on occasion they may be

submerged up to their shoulders) could result in oil coating its feathers in the event of an oil spill. And lastly, ingestion of oil coated prey may be adverse to the individual bird's well-being and reproductive capability and could prove harmful to the species.

Since the probability of an oil spill occurring during exploration activities is minimal and existing facilities will be utilized, it is my biological opinion that the leasing and exploration activities are not likely to jeopardize the continued existence of the whooping crane or destroy or adversely modify its Critical Habitat. GS should continue to place aircraft height restrictions on the helicopter and fixed-wing aircraft traffic around the whooping crane's winter Critical Habitat on and adjacent to the Aransas National Wildlife Refuge from October to April. Furthermore, should any onshore activities requiring any Federal action be proposed for the area between Port Aransas and Port O'Connor that would affect the whooper environment, Section 7 consultation will be required. Additionally, any activity or program authorized, funded, or carried out by a Federal agency which may affect the whooping crane, especially nearshore or onshore pipelines associated with development/production activities, Section 7 consultation will be required.

Mississippi Sandhill Crane (Grus canadensis pulla)

Records indicate that the Mississippi sandhill crane was probably never very common. It is presently restricted to a relatively small area in Jackson County, Mississippi. The species was classified as Endangered on June 4, 1973, and its Critical Habitat was promulgated in the August 8, 1977, Federal Register. Present population estimates range from 30 to 50 individuals.

The species is non-migratory and has established fairly restricted nesting, feeding, and winter roosting areas. Nesting is normally limited to the semi-open, wet, savanna areas within its range. All known current nesting occurs within the Critical Habitat area with the exception of one nest approximately 8 miles north of this area. Feeding is generally limited to the wet savanna or marsh and agricultural fields and pastures. Their diet is varied and includes insects, aquatic animals, and plant material, including roots and tubers and grain from agricultural fields. Winter roosting areas have been identified within the Pascagoula River swamp area east of the nesting area.

The current status of the species is attributed to habitat loss which has occurred from land drainage and other land use practices. Drainage projects have increased the potential for both commercial development and the conversion of many acres into pine plantations. Other land changes are associated with the present grazing laws. Previous open range laws have prompted the use of fire to maintain grazing conditions. Recent closed grazing laws, however, in addition to increased pine plantations, have generally precluded the use of fire in most areas.

It is my biological opinion that impacts relative to the leasing and exploration activities are not likely to jeopardize the continued existence of the Endangered Mississippi sandhill crane or result in adverse modification or destruction of its Critical Habitat. However, any activity or program authorized, funded, or carried out by a Federal agency, particularly those related to development/production activities of the lease areas, which may affect the Endangered Mississippi sandhill crane or its Critical Habitat, will require Section 7 consultation.

Brown Pelican (Pelecanus occidentalis)

The brown pelican was originally listed as Endangered on October 13, 1970. The bird normally ranges on the eastern seaboard from North Carolina to Florida and around the Gulf coast to Texas and Mexico, southward to Venezuela, as well as the West Indies and Islands of the Caribbean. Within the United States a small population of about 50 individuals exists in Texas and is increasing slowly. Louisiana populations are those restocked from Florida since 1968, plus offspring from those birds. This new Louisiana population suffered a decline of approximately 40 percent in 1975 and now numbers about 200 birds. Both Carolina populations are relatively small and nearly stable. In Florida a stable population of 20,000 - 30,000 is reported. Critical Habitat has not yet been determined for this species.

The habitat of these colonial nesters is small coastal islands in salt and brackish waters. Nests are constructed from available vegetation. The major food of the pelican is fish, including menhaden, mullet, sardines, and pinfish. The pelican catches these fish by plunge-diving in coastal waters. Brown pelicans are rarely found away from saltwater and typically do not venture more than 20 miles (32 km) out to sea. Extensive use of pesticides which were ultimately ingested by the brown pelican has been noted as the primary cause of the current population decline of the species.

Pelicans may be susceptible to oil spills. As brown pelicans dive for fish, their entire body can be coated with oil. This may contribute to direct mortality or could result in a secondary impact in reduced hatchability of eggs that may become oiled by a contaminated adult bird.

The brown pelican is extremely susceptible to disturbance and habitat alteration of key nesting areas. It is imperative to prevent disturbance of nesting colonies that could cause nest desertion and egg losses.

Since existing onshore facilities will be utilized, and the possibility of an oil spill occurring from exploration activities is minimal, it is my biological opinion that the leasing and exploration activities are not

likely to jeopardize the continued existence of the species. However, any activity or program authorized, funded, or carried out by a Federal agency, particularly those related to proposed onshore facilities and development/ production related activities, will require Section 7 consultation.

Bald Eagle (Haliaeetus leucocephalus)

The bald eagle was initially considered to have two distinct subspecies when the southern bald eagle was listed as an Endangered species in the Federal Register of March 11, 1967. The entire species was listed as Endangered in 43 of the conterminous 48 States and Threatened in the remaining five States on February 14, 1978. The bald eagle populations occurring within the area which may be impacted by this proposal are listed as Endangered.

In the Southeast, bald eagles actively nest in South Carolina, Florida, Mississippi, Louisiana, and Texas. Suitable habitat appears to be available in North Carolina, Georgia, and Alabama but there is no known nesting activity in these States. Nesting occurs from November to April in the Gulf coast area.

Florida had at least 319 active nesting territories distributed throughout most of the State during the 1977-78 nesting season. The west coast counties of Florida have a large number of active bald eagle nesting territories. With the exception of Dixie and Jefferson Counties, each county from Franklin east and south along the Gulf has nesting bald eagles. Concentrations of nesting territories are from the Waccasassa River to Tampa Bay and from Englewood through Florida Bay.

The only known active nest in Mississippi is in Harrison County. The nest is inland and within visual distance of Interstate 10. There were nine reported active territories in Louisiana during the 1977-78 nesting season, located primarily in the coastal parishes. Approximately 8 to 11 breeding pairs of eagles are located in Goliad, Refugio, Calhoun, Victoria, Matagorda, Brazoria, Orange, and Trinity Counties in Texas.

Eagles are opportunistic feeders, with fish constituting the bulk of their diet. They will also feed on waterfowl and shorebirds, particularly sick or injured individuals, as well as carrion. Throughout most of the bald eagle's range, its population decline has been largely attributed to the effect of pesticide ingestion which resulted in eggshell thinning and indiscriminate shooting of both immature and adult birds. Florida appears to be an exception, where the primary factors at this time are loss of habitat through urbanization.

The two potential sources of impact to the eagle from leasing and exploration activities are disturbance to its nests, resulting from development of onshore facilities, and the possibility of an oil spill reaching the coast and contaminating the food source of the eagle.

Since the onshore facilities for leasing and exploration activities will be those already in existence and the possibility of an oil spill occurring during exploration activities is minimal, it is my biological opinion that these activities are not likely to jeopardize the continued existence of the bald eagle. However, any activity or program authorized, funded, or carried out by a Federal agency, especially development/production activities, which may affect bald eagles or active nesting sites, will require Section 7 consultation.

Sea Turtles

Populations of the listed sea turtles have declined due to commercial overutilization of eggs and turtles, increased natural predation on eggs and hatchlings, incidental catches by commercial fishermen, and possibly littering of the seas (plastic bags give the appearance of jellyfish and can kill if consumed).

Sea turtle nesting habitat may be impacted by oil spills and human disturbance resulting from OCS activities. Disturbance by development and other human use of beaches is incompatible with successful sea turtle nesting. Sea turtles hatch at night and move toward the brighest light, which normally would be the moon reflecting on the ocean. Bright lights in the nesting beach areas could disorient this migration, rendering the young turtles vulnerable to road traffic or predators.

The National Marine Fisheries Service (NMFS) has jurisdiction over Endangered sea turtles while they are in the aquatic environment. When the turtles are onshore they are under the jurisdiction of FWS. Therefore, the following information on five sea turtles relates to impacts of leasing and exploration activities on onshore turtle habitat.

The effect of development/production activities on sea turtles is not included as those phases are not being consulted on at this time. It should be noted, however, that we are currently unaware of the existence of much information concerning the effect of oil spills on nesting sea turtles and their habitats.

Kemp's Ridley Sea Turtle (Lepidochelys kempii)

The Kemp's ridley sea turtle was originally listed as Endangered on December 2, 1970. The adult turtle is found only in the Gulf of Mexico. Immature ridleys also occur along the Atlantic coast as far north as Massachusetts and are sighted infrequently along European shores. The essential habitat of the Kemp's ridley includes shallow coastal and estuarine waters often associated with subtropical shorelines of red mangrove. In the United States, this species is believed to sporadically nest in Kleberg, Kenedy, Willacy, and Cameron Counties, Texas. The entire population now nests primarily on approximately 14 miles (24 km) of beach in the State of Tamaulipas, Mexico. Nesting female population estimates for 1947 were 40,000; 2,000 to 4,000 in 1973; 400 to 500 in 1976; and approximately 300 in 1978. Currently, there exists an international project to reestablish a viable breeding population on Padre Island National Seashore. In 1978, turtle eggs were collected in Mexico and hatched and imprinted in the United States.

Portunid crabs (Callinectes spp.) make up a large portion of the turtle's diet. These turtles also feed on other crabs, shrimp, snails, echinoderms, medusae, and fish. The northern Gulf off the coast of Louisiana has been identified as a major feeding area.

Although the Kemp's ridley sporadically nests on Padre Island and is believed to nest on the beaches of Kleberg, Kenedy, Willacy, and Cameron Counties on the Texas Gulf coast, it is my biological opinion that leasing and exploration activities are not likely to jeopardize the continued existence of the Kemp's ridley sea turtle. This is due to the minimal likelihood of an oil spill occurring during exploration activities, and that existing onshore facilities will be utilized Should additional onshore facilities or a change in the use of the existing facilities be proposed, Section 7 consultation will be required. Additionally, any activity or program authorized, funded, or carried out by a Federal agency, particularly development/production activities, which may affect the nesting sites of the Kemp's ridley, will require Section 7 consultation.

Hawksbill Sea Turtle (Eretmochelys imbricata)

The hawksbill turtle was originally listed as Endangered on June 2, 1970. The distribution of the hawksbill in the Atlantic Ocean extends from southern Brazil to Massachusetts. Nesting occurs on scattered islands and shores generally between 25 degrees north and south latitude. In the conterminous United States there have been only two reported nestings in Florida.

Hawksbills frequent rocky areas, reefs, shallow coastal areas, lagoons of oceanic islands, and narrow creeks and passes, and are generally found in water less than 20 meters deep. Hatchlings are often found floating in masses of sea plants. Nesting is at random, probably without established nesting sites, usually on undisturbed deep-sand beaches in the tropics.

The hawksbill feeds on the bottom and forages close to shores and reefs. It is omnivorous although it prefers invertebrates.

Population estimates are not available. Although the former distribution was probably equal to the present, population numbers have declined considerably. Many nesting beaches have been abandoned due to natural disasters (such as hurricanes and erosion), alteration of habitat, or commercial utilization by man.

It is my biological opinion that since the hawksbill turtle is not known to nest on the beaches in the Gulf of Mexico, the leasing and exploration of OCS lands are not likely to jeopardize the continued existence of the hawksbill turtle or destroy or adversely modify nesting habitat essential to its survival and recovery.

Leatherback Sea Turtle (Dermochelys coriacea)

The leatherback turtle was originally listed as Endangered on December 2, 1970. Critical Habitat in the Virgin Islands has been determined and was published in the Federal Register on September 26, 1978. The distribution of the leatherback is worldwide, consisting of tropical Atlantic, Pacific, and Indian Oceans. It is also found in small numbers in waters as far north as British Columbia, Newfoundland, the British Isles, and as far south as Australia, Cape of Good Hope, and Argentina. The leatherback has also been sighted in the Mediterranean Sea. It was formerly more widely distributed in the Mediterranean, Atlantic, Pacific, and Indian Oceans. The major nesting beaches are in Malaysia, Surinam, French Guiana, Mexico, Costa Rica, and South Africa.

Although one nest was reported to have occurred in 1966 in North Carolina, nesting in the United States is usually restricted to Florida. Atlantic coast nests have been recorded from Flagler Beach to Miami with the majority of records from Palm Beach and Martin Counties. There appears to be a small population that nests regularly on Hutchinson Island, Martin County. On the Gulf coast, sightings are common in March and April. Nesting has been reported on the Florida Gulf coast.

The most pelagic of the sea turtles, the leatherback may often be found near the edge of the continental shelf. In northern waters they occasionally enter shallow estuarine bays.

The leatherback is an omnivorous turtle. Its preferred food is jellyfish, but it also consumes sea urchins, squid, crustaceans, tunicates, fish, blue-green algae, and floating seaweed.

Since the leasing and exploration activities in the Gulf of Mexico will use existing onshore facilities, and the likelihood of an oil spill resulting from exploration activities is minimal, it is my biological opinion that these activities are not likely to jeopardize the continued existence of the leatherback turtle. However, any activity or program authorized, funded, or carried out by a Federal agency, particularly additional onshore facilities for exploration activities and development/production proposals, will require Section 7 consultation.

Green Sea Turtle (Chelonia mydas)

The green sea turtle was listed as Threatened in the Federal Register on July 28, 1978, in all of its eastern North American range except the State waters of Florida, where it is Endangered. Critical Habitat has not yet been determined.

This turtle has a broad, heart-shaped shell and small head, and is found throughout the world in tropical and semi-tropical waters. In eastern North America it is found from the coasts of Massachusetts to Mexico. The known United States nesting is limited to southern Florida beaches. Nesting on the east coast ranges from Cape Canaveral National Seashore southward with concentrations located on Merritt, Hutchinson, and Jupiter Islands, and Hobe Sound National Wildlife Refuge; and on the west coast from Marco Island to the Florida Keys. Favored habitat appears to be lagoons and shoals with an abundance of marine grass and algae. Adult green turtles are primarily herbivorous, although mollusks and crustaceans are also eaten. Immature green turtles are more omnivorous than adults in their feeding habits.

Since the leasing and exploration activities will utilize existing onshore facilities, and the possibilty of an oil spill occurring during exploration activities is minimal, it is my biological opinion that these activites are not likely to jeopardize the continued existence of the green turtle. However, any activity or program authorized, funded, or carried out by a Federal agency, particularly additional onshore facilities and development/production proposals, will require Section 7 consultation.

Loggerhead Turtle (Caretta caretta)

The loggerhead sea turtle was listed as Threatened in the Federal Register on July 28, 1978. The loggerhead is a large sea turtle weighing up to 300 pounds and occurs on the east coast of North and South America from Newfoundland to Argentina and in the Canary Islands. The loggerhead wanders widely throughout

the marine waters of its range and has been found as far as 500 miles out in the open sea. Nesting occurs on various barrier islands and beaches from Chincoteague National Wildlife Refuge, Virginia, south to the Florida Keys on the east coast. In the Gulf of Mexico, loggerheads nest on various barrier islands and beaches throughout the Keys and up the Florida west coast to the Chandelier Islands, Louisiana. The loggerhead feeds primarily on shellfish. They will also feed on fish, sponges, jellyfish, and marine grasses.

Since the leasing and exploration activities will utilize existing facilities, and the possibility of an oil spill occurring during exploration activities is minimal, it is my biological opinion that these activities are not likely to jeopardize the continued existence of the loggerhead. However, any activity or program authorized, funded, or carried out by a Federal agency, particularly additional onshore facilities and development/production proposals, will require Section 7 consultation.

American Alligator (Alligator mississippiensis)

The American alligator was originally listed as Endangered on March 11, 1967, and subsequently was reclassified as Threatened (similarity of appearance) in Cameron, Vermilion and Calcasieu Parishes in Louisiana in the Federal Register on September 26, 1975. It was reclassified as Threatened in the wild in Florida and in certain areas of Georgia, Louisiana (except in Cameron, Vermilion, and Calcasieu Parishes), South Carolina, and Texas in the Federal Register on January 10, 1977. The distribution of the alligator in the United States extends from North Carolina to south Florida and the Gulf coast states and inland to Oklahoma and Arkansas. Critical Habitat has not yet been determined for the alligator. The alligator prefers fresh water but can tolerate different levels of salinity, and in coastal areas it can adapt to brackish water. The alligator prefers marsh areas but is found in small ponds, creeks, man-made canals, rivers, streams, and estuarine bays. The alligator preys chiefly on vertebrates such as fish, frogs, turtles, and nutria. Available carrion is also eaten.

The alligator was listed primarily because of commercial overharvesting and habitat loss. The alligator has recovered to a Threatened status in the coastal areas of Texas, South Carolina, Georgia, Louisiana, and Florida.

Two potential impacts from exploration activities are recognized. One is that oil could contaminate the alligator's food source. However, the effects of ingested oil on the alligator is not known at this time. The other impact would occur if onshore development decreased the suitable habitat necessary for the survival and recovery of the alligator.

Since the leasing and exploration activities will utilize existing facilities, and the possibility of an oil spill occurring during exploration activities is minimal, it is my biological opinion that these activities are not likely to jeopardize the continued existence of the American alligator. However, any activity or program authorized, funded, or carried out by a Federal agency, particularly related to onshore activities of expanded exploration and proposed development/ production activities, will require Section 7 consultation.

Florida Manatee (Trichechus manatus)

The Florida manatee was originally listed as Endangered on March 11, 1967. Historically, the range of the manatee in the United States was from New Jersey to southern Texas, with an estimated population of several thousand individuals. The present range of the species in the United States is from North Carolina to Louisiana. The present estimated population is 750 to 900 animals, mostly concentrated in Florida.

The manatee is apparently migratory. During the winter months when the water temperature to the north drops below 21°C, manatees concentrate on the coast of peninsular Florida from the Crystal River (west coast) around the Florida peninsula to Titusville (east coast), and from Jacksonville south in the St. Johns River. During the summer months the population disperses along the coast.

Critical Habitat for this species has been determined and was published in the Federal Register on September 24, 1976. It includes portions of the Florida Gulf coast in Hillsborough, Manatee, Sarasota, Charlotte, Lee, Collier, and Monroe Counties. The manatee is an aquatic herbivore feeding on submergent, emergent, and floating plants apparently in that order of preference.

Initial population decreases resulted from commercial overharvesting for meat, oil, and leather, but the primary reason for the current Endangered status of the Florida manatee is attributed to mortality from accidental collisions with boats and barges. However, malicious killings do occur to an unknown degree. Actual physical habitat loss is of secondary importance, but the impact of increased boat traffic on manatee habitat is considered serious.

Because of the increasing recreational boating activities, increased support boat traffic for dredging, and existing commercial boat traffic, it is my biological opinion that boating activities between Cedar Key and Key West, Florida resulting from OCS leasing and exploration, with possible development (should significant quantities of oil and gas be discovered), are likely to jeopardize the continued existence of the Florida manatee and to adversely modify its Critical Habitat. It is my belief that the use of Tampa/Port Manatee as the support base for exploration activities resulting from OCS lease sales on the west Florida shelf would avoid jeopardizing the manatee or

adversely modifying the manatee's Critical Habitat even though this port is adjacent to the designated Critical Habitat of the manatee, because impacts are expected to be minimal when boating activities are restricted to the deeper ship channels from Egmont Channel to Port Manatee. Any OCS oil and gas activities resulting from OCS lease sales which anticipate the use of bases of operation between Cedar Key and Key West, with the exception of Tampa/Port Manatee, may affect the manatee and will require Section 7 consultation. Requests for consultation must include the following information:

a. Location of the port to be used for operations;

b. Routes or channels to be used by the vessels and the relationship between these routes and manatee habitat or migration routes;

c. Description of vessels to be used for support of OCS operations (design, speed, draft, and other pertinent information);

d. Determination of whether the vessels used for OCS oil and gas operations have characteristics which would be more detrimental to manatees than those currently used in manatee habitat.

American Crocodile (Crocodylus acutus)

The American crocodile was listed as Endangered in the Federal Register on September 25, 1975. Critical Habitat was designated in the Federal Register on September 24, 1976. The crocodile lives only in southern Florida where estimates of the present population range from 200-400 individuals.

They breed only in southern portions of Everglades National Park, chiefly along Florida Bay, and on adjacent Key Largo. Another population is reported from the Lower Florida Keys on Big Pine, Little Pine, and Howe Pine with breeding rumored on Little Pine Key. Individuals have been reported in Biscayne Bay on the east coast of Florida and Marco Island and Charlotte Harbor on the west coast.

The decline of the crocodile is due to habitat loss from the increased urbanization of south Florida and from the increased human recreational use of the area. Mortality due to commercial fishing nets and automobiles, as well as malicious killings by uninformed people, have all contributed to the decline of the American crocodile.

The crocodile utilizes coastal areas and inhabits more saline areas than alligators. Adults feed primarily on fish and the young on aquatic invertebrates. Nest construction begins in April, egg laying in April

or May, with the hatch occurring in July and August. Although the ritualistic nesting requirements are not thoroughly understood, it is felt that nest disruption from human disturbance during the incubation and hatching period could be a critical factor.

There have been only a few exploratory wells drilled south of Naples, Florida. Due to the American crocodile's narrow geographical range, low numbers, and coastal habitat, it is an extremely sensitive species. Although the direct effects of oil on the crocodile are not known, an oil spill which reaches the coastal area could contaminate their food source.

Because of the minimal possibility of an oil spill occurring during exploration activities, and the anticipated use of existing onshore facilities, it is my biological opinion that leasing and exploration activities are not likely to jeopardize the continued existence of the American crocodile or destroy or adversely modify the Critical Habitat of the species. However, if a significant amount of oil and gas are found during exploration, development/production will follow. Any development/production activities occurring in or near the Cape Sable/Florida Bay area will require Section 7 consultation. At that time, further information will be necessary to determine the effects on the American crocodile. This information should include site specific transportation methods to be used, location of all onshore facilities associated with OCS activities, an oil spill trajectory study including current direction/velocity information, and other pertinent information.

Schaus' Swallowtail Butterfly (Papilio aristodemus ponceanus)

The Schaus' swallowtail butterfly was listed as Threatened in the Federal Register on April 28, 1976. Prior to its discovery in Biscayne National Monument in 1971, this butterfly was on the verge of extinction due to overcollecting and habitat destruction by developers. It's distribution is limited to the areas of tropical hardwood hammocks around Biscayne National Monument.

The loss of suitable habitat would adversely affect the Schaus' swallowtail butterfly. However, since existing onshore facilities will be utilized, it is my biological opinion that leasing and exploration activities are not likely to jeopardize the continued existence of this species. However, any activity or program authorized, funded, or carried out by a Federal agency, particularly any onshore development proposed for the Florida Bay area, will require Section 7 consultation.

Bahaman Swallowtail Butterfly (Papilio andraemon bonhotei)

The Bahaman swallowtail butterfly was listed as Threatened in the Federal Register on April 28, 1976. The butterfly is found around Biscayne National Monument, living in the tropical hardwood hammocks.

Habitat destruction is a threat to the Bahaman swallowtail butterfly. Since the leasing and exploration activities will utilize existing facilities, it is my biological opinion that these activities are not likely to jeopardize the continued existence of this butterfly. However, any activity or program authorized, funded, or carried out by a Federal agency, particularly any onshore development proposed for the Florida Bay area, will require Section 7 consultation.

Key Deer (Odocoileus virginianus clavium)

The Key deer was originally listed as Endangered in the Federal Register on March 11, 1967. The population ranges from 400 to 600 individuals. Loss of suitable habitat is the major reason for the Key deer's population decrease. The deer's range is restricted to the islands of the Lower Florida Keys, but only those islands with a permanent fresh water supply are used consistently. Big Pine Key and No Name Key support the largest deer populations.

Key deer will eat any available vegetation, but prefers red mangrove.

With the increase of urban development of the Florida Keys, the habitat of the Key deer is decreasing. Since the leasing and exploration activities will utilize existing onshore facilities, it is my biological opinion that these activities are not likely to jeopardize the continued existence of the Key deer. However, any activity or program authorized, funded, or carried out by a Federal agency, particularly onshore activities associated with development/production, will require Section 7 consultation.

There are seven additional species included in this consultation request which we will address together. They are the American peregrine falcon (Falco pereginus anatum), the Eskimo curlew (Numenius borealis), the Everglade kite (Rostrhamus sociabilis plumbeus), the Cape Sable sparrow (Ammospiza maritima mirabilis), the Bachman's warbler (Vermivora backmanii), the Kirtland's warbler (Dendroica kirtlandii), and the Ivory - billed woodpecker (Campephilus principalis). These six species, based upon their habitat needs, are not known to occur in areas where leasing and exploration activities could impact them. Therefore, it is my biological opinion that

the leasing and exploration activities are not likely to jeopardize the continued existence of these species or destroy or adversely modify their Critical Habitat.

Florida Bay

Although this consultation is species oriented rather than being directly conducted for ecosystems, we feel it is appropriate to mention Florida Bay due to its unique character, fragility, and value to Endangered and Threatened species. Within the confines of this vast shallow bay with its associated myriad mangrove swamps and scattered keys, resident or migratory listed species include: the Arctic peregrine falcon, the brown pelican, the bald eagle, the Kemp's ridley turtle, the leatherback turtle, the green turtle, the loggerhead turtle, the Florida manatee, the American crocodile, the Key deer, the Bahaman swallowtail butterfly, the Schaus' swallowtail butterfly, and several proposed plants.

About 20 years ago, several onshore and offshore wells were drilled and subsequently abandoned in the Florida Bay area. At that time, however, the human development of this area was not as extensive nor was the stress placed on the Endangered and Threatened species as great. We have identified this area as a sensitive area and thus exploration or development/production activities proposed in this area may affect Endangered species and will require Section 7 consultation. Additional information will be needed at the time of consultation. This will include an oil spill trajectory study, the type and amount of activities, and the secondary activities which could result.

This information is required to facilitate the FWS in our determination as to whether activities or programs are likely to jeopardize the continued existence of a species or destroy or adversely modify its Critical Habitat.

Cumulative Effects

There are numerous offshore and coastal projects and activities throughout the Gulf of Mexico. Those which could have an impact on the Endangered and Threatened species considered in this regional Gulf oil and gas leasing and exploration consultation will be presented by state.

Texas

The U.S. Army Corps of Engineers (Corps) has numerous maintenance dredging projects underway or proposed. These maintenance projects include dredging in the Intracoastal Waterway and the ports along the eastern Texas coast.

There are two Corps projects which are not maintenance dredging. They are the widening of the Texas City Channel and turning basin, and the widening of the Brownsville Ship Channel and turning basin. In addition, there are two private dredging projects proposed for this area. The first is a plan to enlarge Sabine Pass to accomodate large ships unloading butane and propane. The second is to enlarge Galveston Harbor and Channel, again to accomodate large petroleum product carriers.

There is a deepwater port proposal for Corpus Christi, Texas. The FWS has recommended that one of the alternatives be adopted instead of the original proposal. The recommendation is to place the deepwater port offshore using a single point mooring system.

There is a liquified natural gas (LNG) plant proposal for Matagorda Bay. This proposal is still in the study stage. Another proposal involves the establishment of strategic petroleum reserves in Texas. The proposed locations are Big Hill salt dome in Jefferson County; Nash salt dome in Fort Bend County; and Bryan Mound salt dome, Allen salt dome, Damon Mound salt dome, and West Columbia salt dome in Brazoria County. These strategic petroleum reserves will store petroleum for an infinite amount of time. When the storage areas are first established, the brine pumped from the salt domes will be discharged into the Gulf. After the salt dome petroleum reservoirs are full, brine reservoirs will be created for disposal of brine when oil is extracted from the storage areas. If there is excess brine at this time, it will be discharged into the Gulf.

There was a former proposal, Seadock, Inc., to construct a deepwater port off the coast of Freeport. The Coast Guard placed operational restrictions on the proposal and it was dropped. Recently, the State (Texas) has picked up the proposal and is conducting feasibility studies on the project now renamed the Deep Water Port Authority. The project will utilize a single point mooring system 26 miles from Freeport where large petroleum transporters will unload their cargoes which will then be piped to shore through a 52-inch diameter pipeline.

Geothermal/geopressure development is a new type of resource development being studied in the Gulf. The Bureau of Economic Geology at the University of Texas is presently under contract from the Department of Energy to develop the technology and hardware to utilize the heat and pressure produced. The University is presently drilling a well near Freeport to measure the amount

of heat and pressure that is produced over a period of time, and then will calculate how much can be recovered. The brine for geothermal/geopressure drilling will be reinjected into a lower pressure reservoir.

Louisiana

The Corps has numerous maintenance dredging projects along the coast in the ports and in the Intracoastal Waterway. There are two Corps projects which are not maintenance dredging projects. The first is the enlargement of Atchafalaya River and the Chene, Beouf, and Black Bayou to accomodate large offshore drilling equipment. The second project is to alleviate the navigation hazards along the Bayou Lafourche and the Bayou Lafourche-Jump Waterway. They will be dredging the auxiliary channel.

The Louisiana Offshore Oil Port (LOOP) project began construction in October 1977, and will be completed in December 1989. There are three phases to the construction of the LOOP and upon completion there will be six single point mooring systems where foreign petroleum tankers can unload their cargo. From the mooring systems, the cargoes will go through a pipeline (56-inch diameter) to the offshore terminal. This offshore system will be located 18 miles offshore from Galliano. From the terminal, the cargoes will go through a pipeline (48-inch diameter) to the salt dome storage (56,000,000 barrel capacity) at Galliano. From the salt dome storage, petroleum will be pumped via a 42-inch diameter pipeline to St. James Parish for processing or distribution. When the salt dome cavities are first established, the associated brine will be discharged into the Gulf through a 36-inch diameter pipeline near East Timbalier Island. After the cavity formation, a 25,000,000 barrel brine reservoir will be created for use in emptying the cavities when the oil is extracted. When these cavities are being filled and emptied, any brine in excess of the brine reservoir capacity will be discharged into the Gulf. The initial operation will begin in May 1980.

There are potential strategic petroleum reserve sites in Louisiana also. They would function on the same principal as those proposed for Texas. The potential sites are Napoleonville salt dome in Assumption Parish; Bayou Choctaw salt dome in Iberville Parish; Chacahoula salt dome in Lafourche Parish; Cote Blanch Mine in St. Mary's Parish; West Hackberry salt dome and Black Bayou salt dome in Cameron Parish; Vinton salt dome and Sulfur Mines in Calcasieu Parish; and Weeks Island salt dome and Iberia salt dome in Iberia Parish.

Mississippi/Alabama

The Corps has several maintenance dredging projects scheduled and proposed for Mississippi and Alabama including the Intracoastal Waterway. There is a new project in Mobile Bay, Alabama in which the Corps will widen and deepen the Theodore Ship Channel to provide a turning basin.

Florida

There are a number of Corps maintenance dredging projects in various ports and in the Intracoastal Waterway.

There are also several new dredging projects. The deepening of Tampa Bay is presently underway and will take three to five years to complete. There is a proposal to improve the navigation conditions in the Apalachicola River. This would involve a dam or the deepening of the channel. A feasibility study to make Port St. Joe a deepwater port is presently being conducted. The deepening of Port Manatee and the construction of an electric manufacturing plant at that site is another project. There is a minor port at Boca Grande which is being considered for expansion into a deepwater port and the possible association of an offshore terminal. There is presently a petition to the Corps to alter the drainage patterns of Turkey Creek and Indian River toward the east coast of Florida and the St. Johns River toward the west coast.

The Florida Power Corporation is installing two more generating units at the Crystal River Electric Generating Plant. Commercial service will start in 1982 for one unit and 1983 for the other. An access road and railroad spur are needed.

There is an uranium oxide extraction plant which may start construction as early as April 1, 1979, in Tampa.

The crude oil refinery near Port Manatee will start producing early in 1979. It will produce about 15 to 20,000 barrels of petroleum products per day.

Previous OCS lease sales have proposed the use of Tampa/Port Manatee, St. Petersburg, and Pensacola as possible sites for onshore exploration and development/production facilities. As stated in this biological opinion, the use of ports other than Tampa/Port Manatee (with the stated restrictions) will require Section 7 consultation.

Conclusion

Based on my consultation team's review of the above information and other information and data available to the Service, it is my biological opinion that leasing and exploration activities are not likely to jeopardize the continued existence of the Endangered or Threatened species considered herein or result in the destruction or adverse modification of their Critical Habitats with the exception of the Florida manatee. Exploration activities may jeopardize the continued existence of the Florida manatee or adversely modify its Critical Habitat unless Tampa/Port Manatee is utilized as stated in the species account above.

However, should construction of additional onshore facilities be needed or a change in the use of existing facilities be required as leasing and exploration activities expand, especially into the western and eastern Gulf of Mexico, Section 7 consultation will be required. Since it has been determined that development/production activities may affect Threatened or Endangered species, Section 7 consultation will be required between the Geological Survey and the Service.

Should a new species be listed, additional information become available, additional onshore facilities be needed for exploration activities, or the project description, as discussed above, be changed, Section 7 consultation will be required. Any activity or program which is authorized, funded, or carried out by a Federal agency which may affect any Endangered and Threatened species will require Section 7 consultation. I would like to remind the Bureau of Land Management and the Geological Survey of their continuing responsibility, under the Endangered Species Act, to remain cognizant of the status of the Endangered and Threatened species in the Gulf of Mexico, and to recognize potential problems which may develop from Federal activities or those activities requiring Federal authorization or funding. If such a problem arises, Section 7 consultation may be required.

/s/ Lynn A. Greenwalt

cc: Directorate Reading File
DD Chron File
AFA File

FWS/OES:NSweeney:mc 3/30/79
FILE 375.4

APPENDIX F

LIST OF VISUALS

APPENDIX F. VISUALS (see attached envelope)

CENTRAL AND WESTERN GULF OF MEXICO

Visual No. 1 - Lease Status
Visual No. 2 - Geologic and Geomorphic Features
Visual No. 3 - Bottom Sediments, Vegetation and Endangered Wildlife
Visual No. 4 - Recreation, Cultural and Undersea Features
Visual No. 5 - Fisheries and EPA Dumping Sites
Visual No. 6 - Oceanography
Visual No. 7 - Infrastructure, Accidents and Undersea Features
Visual No. 8 - Geopressured-Geothermal Energy in Reservoir Fluids
Visual No. 9 - Bathymetric Mapping
Visual No. 10-Selected Hurricanes Affecting the Southern United States, 1954-1977
Visual No. 11-Submarine Physiography
Visual No. 12-Marine Environmental Studies
Special Overlay No. 1

EASTERN GULF OF MEXICO

Visual No. 1E - Lease Status
Visual No. 2E - Geologic and Geomorphic Features
Visual No. 3E - Bottom Sediments, Vegetation, Endangered Wildlife
Visual No. 4E - Recreation, Cultural and Undersea Features
Visual No. 5E - Coastal Zone, Offshore Fisheries
Visual No. 6E - Oceanography
Visual No. 7E - Infrastructure, Accidents and Undersea Features
Visual No.12E-Marine Environmental Studies
Special Overlay No. 1E

Abbreviations

A/M

BLM	Bureau of Land Management
BP	before present
CEI	Coastal Environments, Inc.
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CZMA	Coastal Zone Management Act
DOD	U.S. Department of Defense
DOE	U.S. Department of Energy
DOI	U.S. Department of the Interior
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
FCMA	Fishery Conservation and Management Act
FCZ	Fishery Conservation Zone
FMP	Fishery Management Plan
FR	Federal Register
FWPA	Federal Water Pollution Control Act
FWS	U.S. Fish and Wildlife Service
GS (also: USGS)	U.S. Geological Survey
GSA	General Services Administration
ICC	Interstate Commerce Commission
LOOP	Louisiana Offshore Oil Port, Inc.
LWCF	Land and Water Conservation Fund
MAFLA	Mississippi, Alabama, Florida
MOU	Memorandum of Understanding
NAS	National Academy of Sciences
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NOS	National Ocean Survey
NPDES	National Pollutant and Discharge Elimination System
OCS	Outer Continental Shelf
OCZM	Office of Coastal Zone Management
PL	public law
SCORP	Statewide Comprehensive Outdoor Recreation Plan
SCUBA	Self Contained Underwater Breathing Apparatus
SIC	Standard Industrial Classification
SUSIO	State University System Institute of Oceanography
USDC	U.S. Department of Commerce
USGS (also: GS)	U.S. Geological Survey

Units Of Measure

A/M

ac	acre
bpd	barrels per day
C	Celsius
cm	centimeter
^{o}	degree
F	Fahrenheit
ft/century	feet per century
ha	hectare
Khz	kilohertz
km	kilometer
km^2	square kilometer
km/hr	kilometer per hour
kn	knot
l	liter
m	meter
m^3	cubic meter
mi	mile
mmb	million barrels
mmcfd	million cubic feet per day
mmmcf	billion cubic feet
mph	miles per hour
nmi	nautical mile
nmi^2	square nautical mile
ppm	parts per million
ppt	parts per thousand
t	ton
ug/l	micrograms per liter

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T/F

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Preparers

Consultation-Coordination

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